ElevateDB Version 2 Manual

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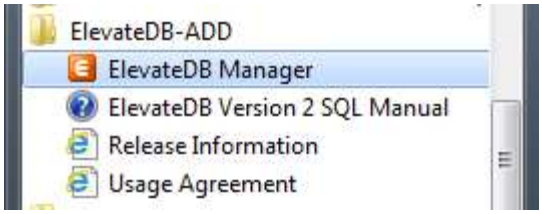
Chapter 1
Local Application Tutorial

1.1 Creating the Tutorial Database

Before creating the actual tutorial application, you must first create the Tutorial database that will be used in the application. The following steps will guide you through creating the Tutorial database using the ElevateDB Manager.

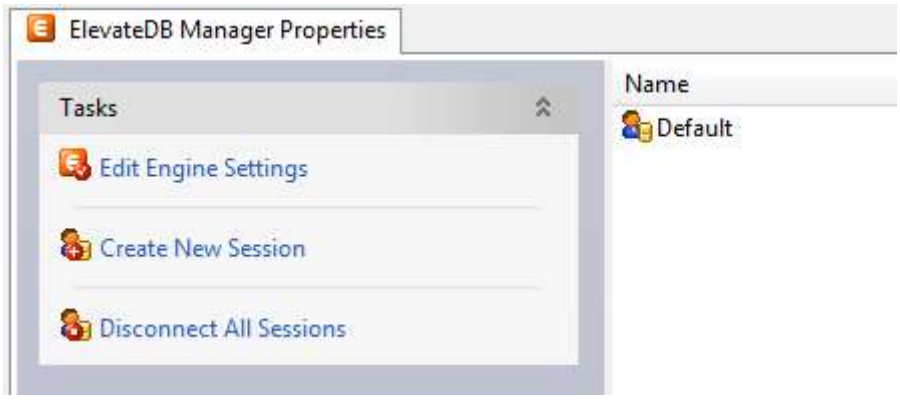
1. Start the ElevateDB Manager (edbmgr.exe) by clicking on the ElevateDB Manager link in the Start menu.

> **Note**
> The ElevateDB Manager is installed with the ElevateDB Additional Software and Utilities (EDB-ADD) installation available from the Downloads page of the web site.

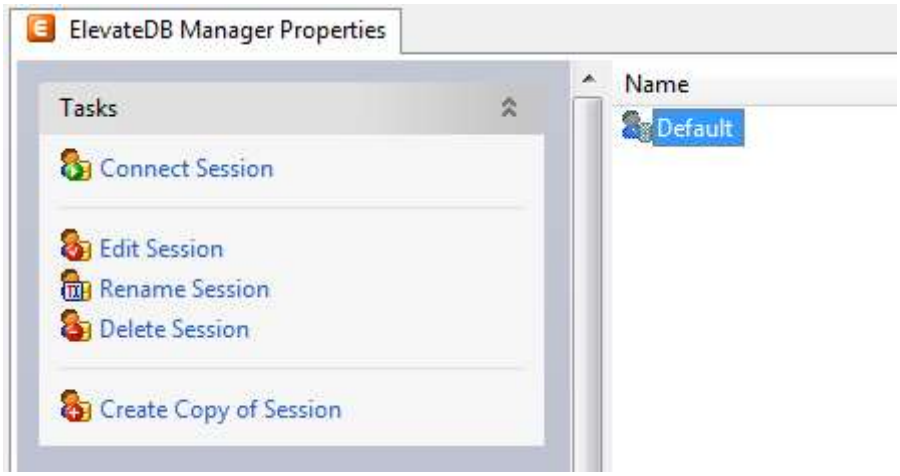


2. Make sure that the session is using the desired character set and configuration file folder (**C:\Tutorial**).

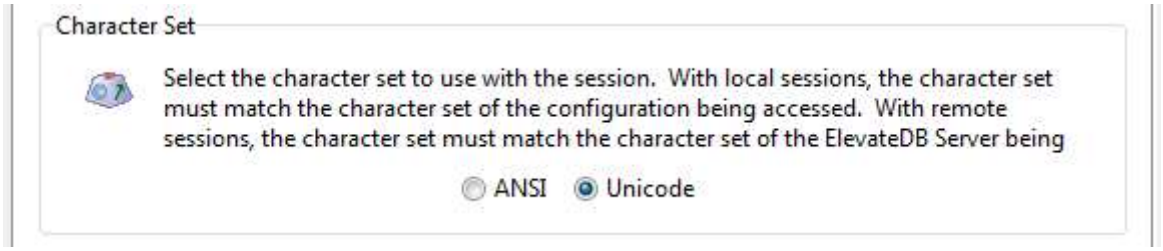
a. Select the **Default** session from the list of available sessions.



b. In the Tasks pane, click on the **Edit Session** link.

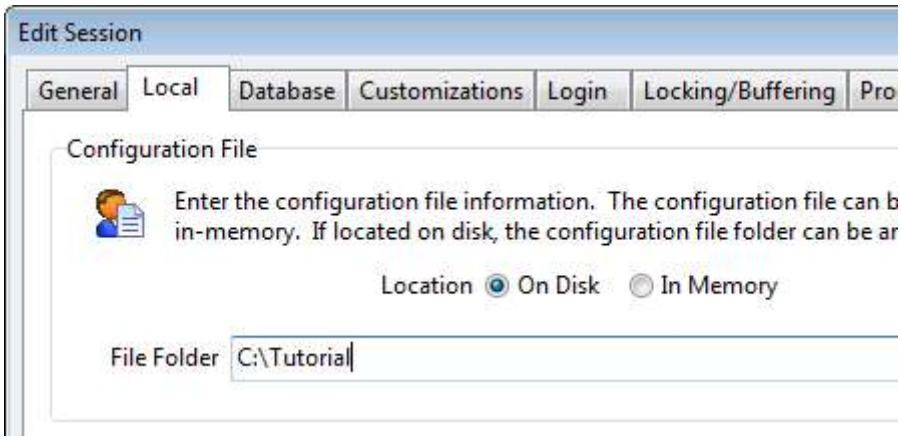


c. On the **General** page of the Edit Session dialog, make sure that the Character Set is set to the desired value - either **ANSI** or **Unicode**.



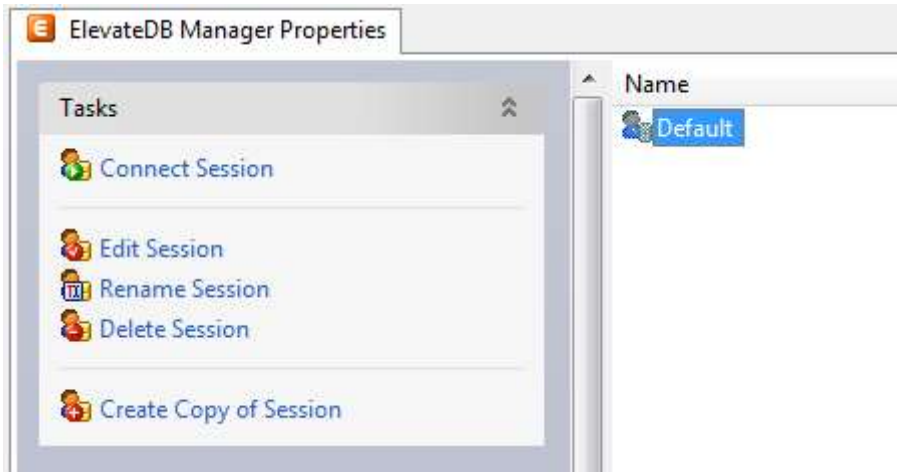
Note
If you're not sure which character set to select and this is the first time using the ElevateDB Manager, then leave the character set at the default of Unicode. The only exception to this rule is if you are using Borland Developer Studio 2005 or lower (including Delphi 5, 6, and 7, as well as C++Builder 5 and 6). You should use the ANSI character set with those older compilers, due to a lack of proper Unicode support for fixed-character and memo field types.

d. On the **Local** page of the Edit Session dialog, make sure that the Configuration File - File Folder is set to the desired folder.

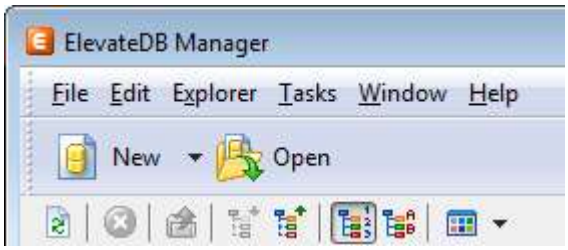


e. Click on the **OK** button.

3. Double-click on the **Default** session in the Properties window in order to connect the session.



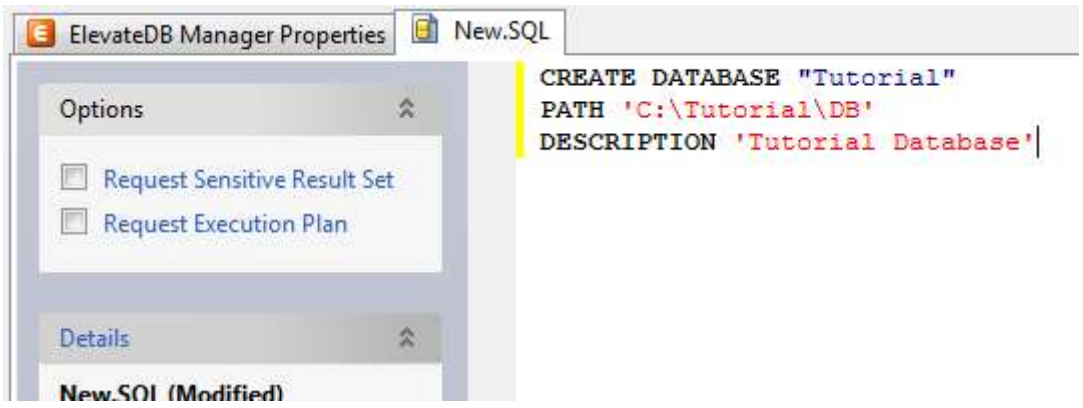
4. Click on the **New** button on the main toolbar.



5. Paste in the following CREATE DATABASE SQL statement in the new SQL window:

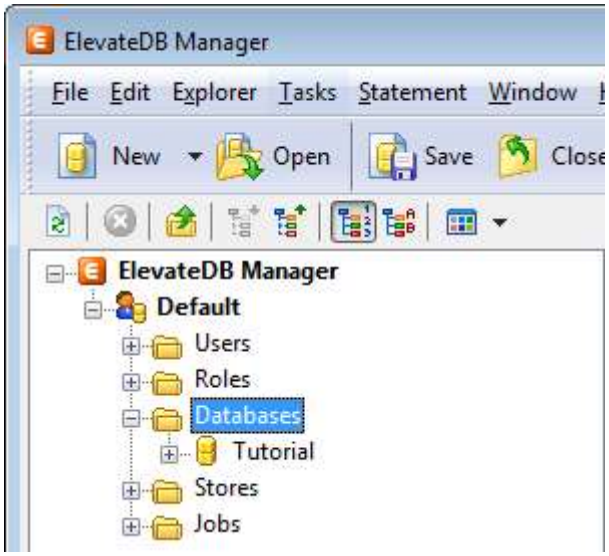
```
CREATE DATABASE "Tutorial"
PATH 'C:\Tutorial\DB'
DESCRIPTION 'Tutorial Database'
```

6. Press the **F9** key to execute the SQL statement.

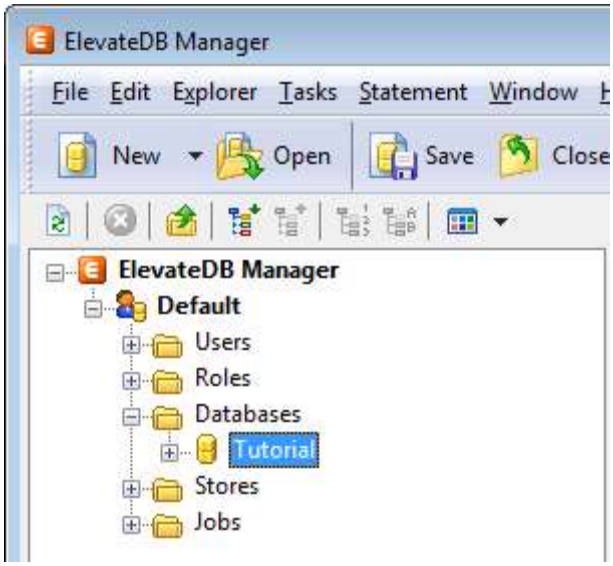


7. Press the **F5** key to refresh the explorer contents for the session.

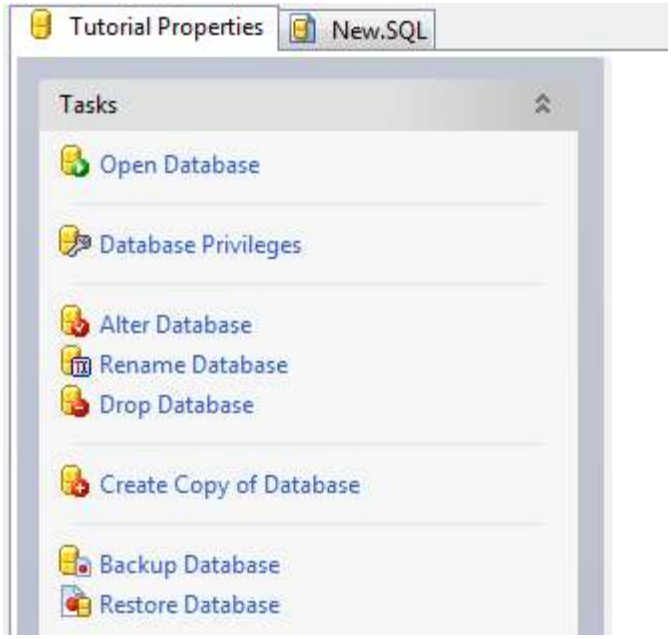
8. Click on the **+** sign next to the **Databases** node in the treeview.



9. Click on the new **Tutorial** database that you just created.



10. Press the **F6** key to make the Properties window the active window, and then click on the **Open Database** link in the Tasks pane.



11. Click on the **New.SQL** tab to bring forward the SQL window.

12. Paste in the following CREATE TABLE SQL statement. If you are using a Unicode session (see Step 2 above), then you should use the Unicode version of the CREATE TABLE statement. If you are using an ANSI session, then you should use the ANSI version of the CREATE TABLE statement:

ANSI

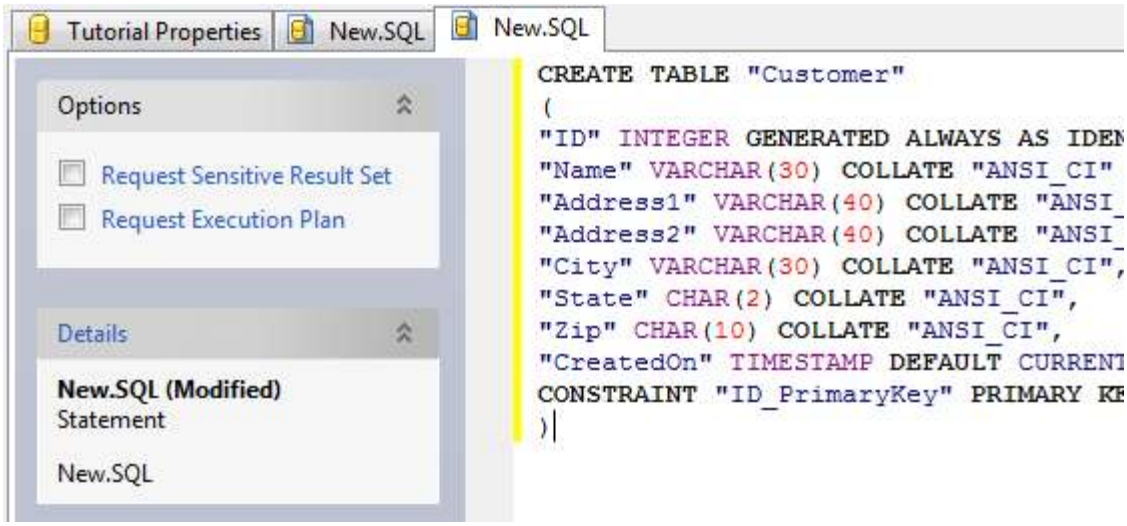
```
CREATE TABLE "Customer"
(
"ID" INTEGER GENERATED ALWAYS AS IDENTITY (START WITH 0, INCREMENT BY 1),
"Name" VARCHAR(30) COLLATE "ANSI_CI" NOT NULL,
"Address1" VARCHAR(40) COLLATE "ANSI_CI",
"Address2" VARCHAR(40) COLLATE "ANSI_CI",
"City" VARCHAR(30) COLLATE "ANSI_CI",
"State" CHAR(2) COLLATE "ANSI_CI",
"Zip" CHAR(10) COLLATE "ANSI_CI",
"CreatedOn" TIMESTAMP DEFAULT CURRENT_TIMESTAMP,
CONSTRAINT "ID_PrimaryKey" PRIMARY KEY ("ID")
)
```

Unicode

```
CREATE TABLE "Customer"
(
"ID" INTEGER GENERATED ALWAYS AS IDENTITY (START WITH 0, INCREMENT BY 1),
"Name" VARCHAR(30) COLLATE "UNI_CI" NOT NULL,
"Address1" VARCHAR(40) COLLATE "UNI_CI",
"Address2" VARCHAR(40) COLLATE "UNI_CI",
"City" VARCHAR(30) COLLATE "UNI_CI",
"State" CHAR(2) COLLATE "UNI_CI",
"Zip" CHAR(10) COLLATE "UNI_CI",
"CreatedOn" TIMESTAMP DEFAULT CURRENT TIMESTAMP,
```

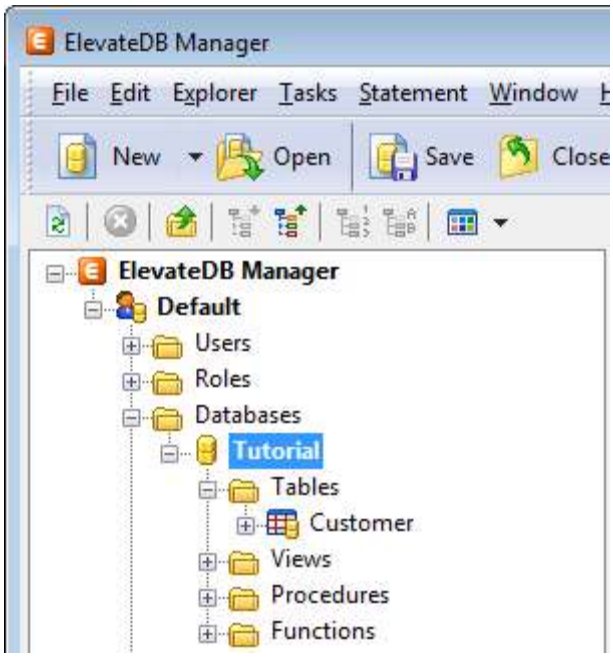
```
CONSTRAINT "ID_PrimaryKey" PRIMARY KEY ("ID")
)
```

13. Press the **F9** key to execute the SQL statement.



14. Press the **F5** key to refresh the explorer contents for the session.

15. The table should now show up in the list of tables for the Tutorial database.



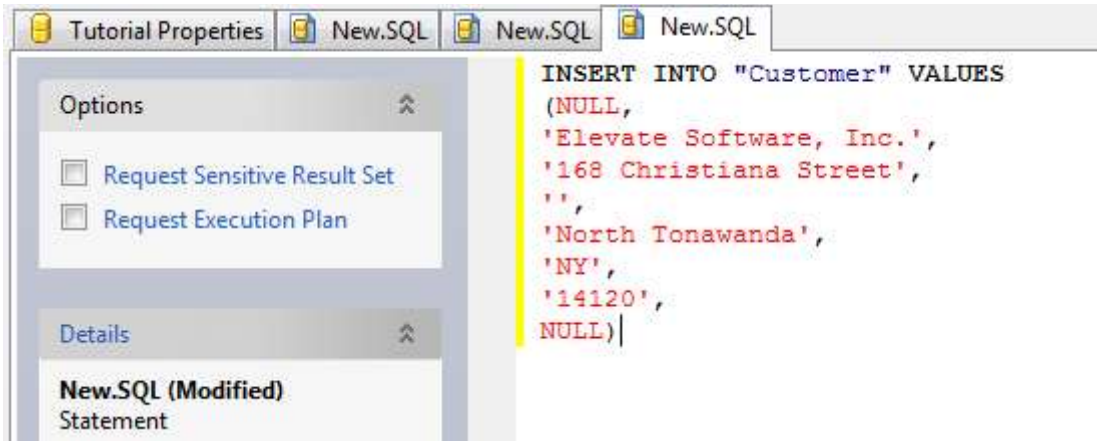
16. Click on the **New.SQL** tab to bring forward the SQL window.

17. Paste in the following INSERT SQL statement:

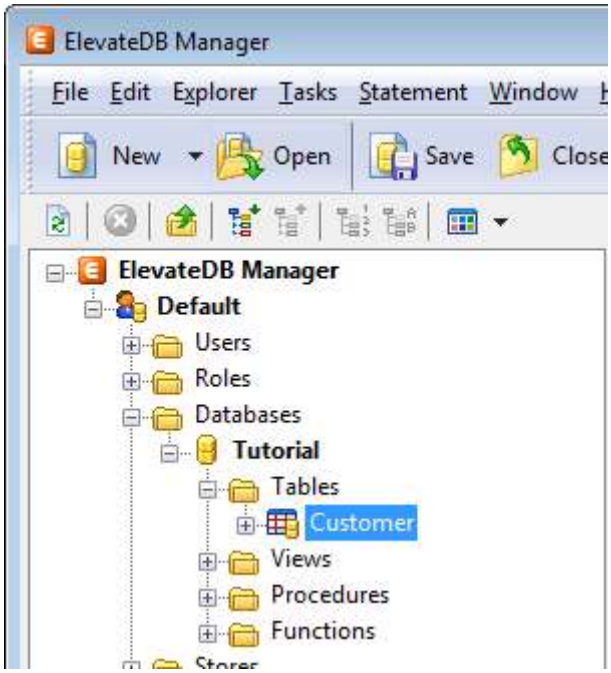
```
INSERT INTO "Customer" VALUES
(NULL,
```

```
'Elevate Software, Inc.',
'168 Christiana Street',
'',
'North Tonawanda',
'NY',
'14120',
NULL)
```

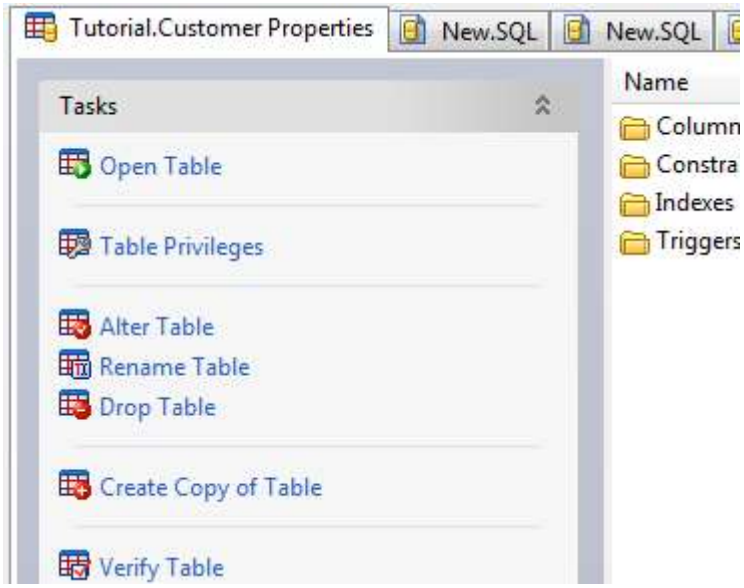
18. Press the **F9** key to execute the SQL statement.



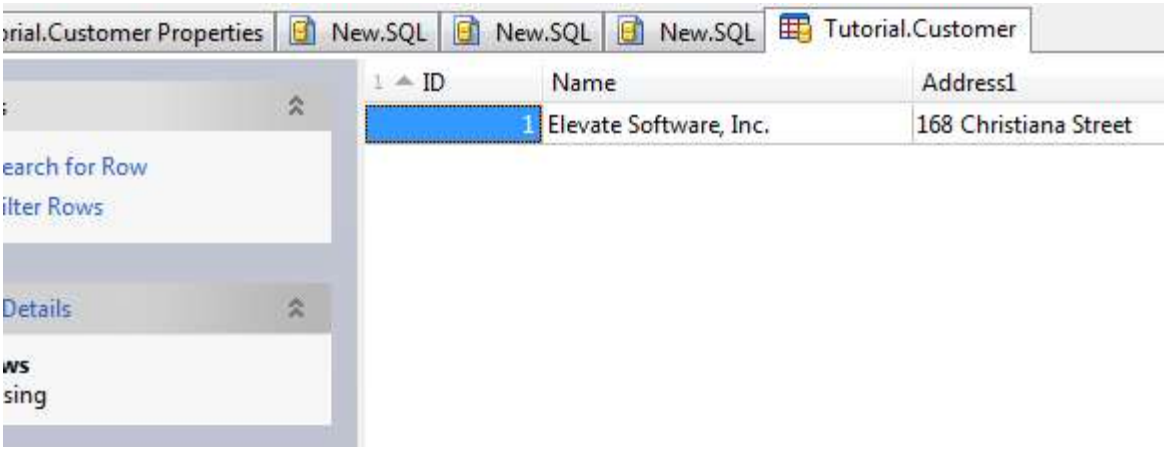
19. Click on the **Customer** table that you just created.



20. Press the **F6** key to make the Properties window the active window, and then click on the **Open Table** link in the Tasks pane.



21. You will now see the row that you just inserted.



You have now successfully created the Tutorial database.

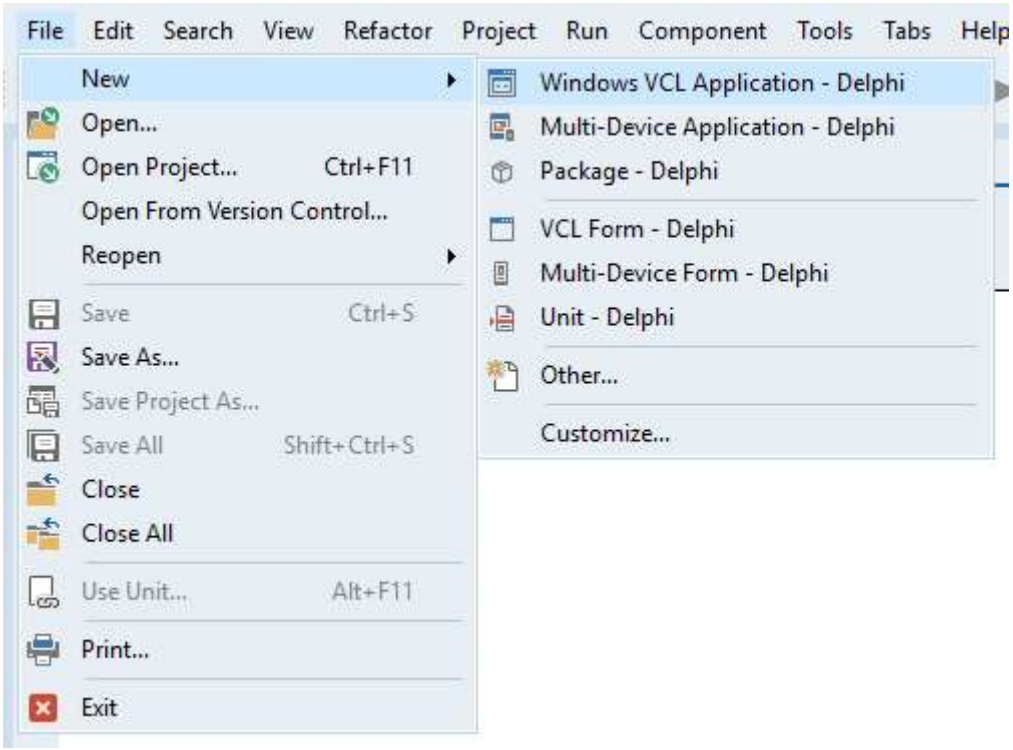
1.2 Creating the Application

The following steps will guide you through creating a basic local application using ElevateDB.

> **Note**
> It is assumed that you have already created the required database using the steps outlined in the Creating the Tutorial Database topic.

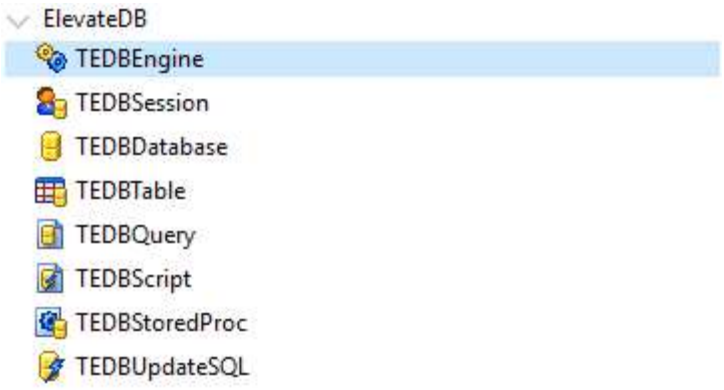
1. Click on the File option from the main menu.

2. Click on the New option from the File menu, and click on the VCL Forms Application - Delphi option from the New sub-menu.

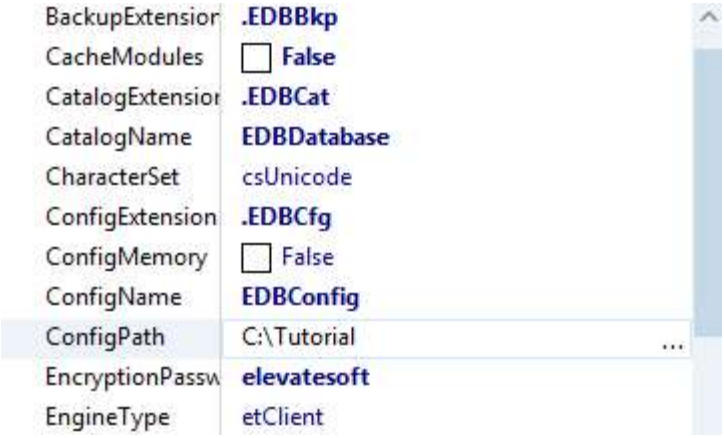


3. Select the ElevateDB group on the tool palette and click on the plus (+) sign to expand the ElevateDB group of components.

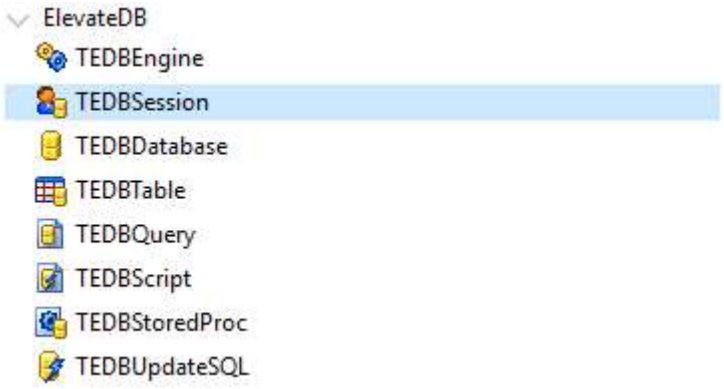
4. Click on the TEDBEngine component on the ElevateDB group on the tool palette and then click on the Form1 form that was created for you by Embarcadero RAD Studio. The TEDBEngine component will be dropped on the form.



5. Hit the F11 key to bring forward the Object Inspector. In the Object Inspector, click on the ConfigPath property and change its value to **C:\Tutorial**.

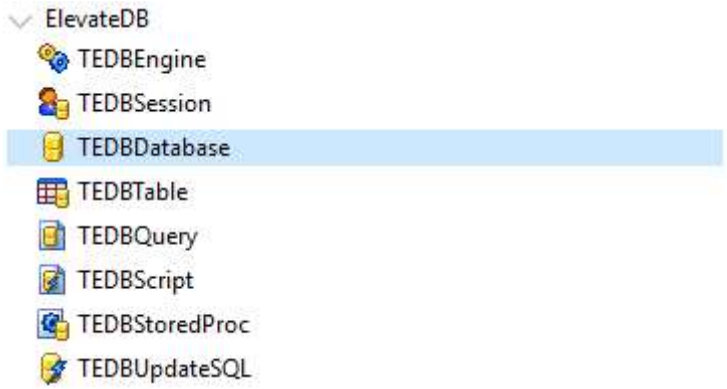


6. Click on the TEDBSession component on the ElevateDB group on the tool palette, and then click on the Form1 form. The TEDBSession component will be dropped on the form.

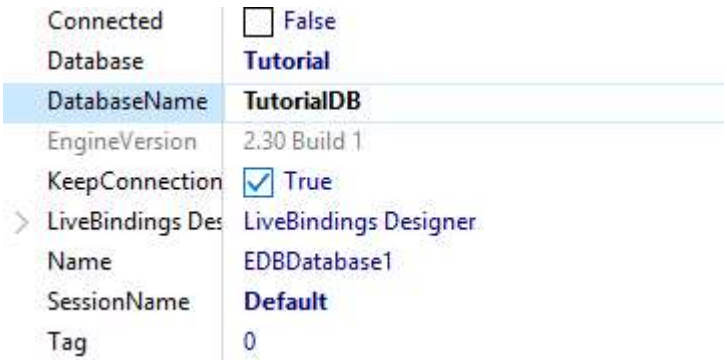


7. Hit the F11 key to bring forward the Object Inspector. In the Object Inspector, click on the SessionName property and change its value to **Tutorial**, click on the LoginUser property and change its value to the default administrator user name **Administrator**, and click on the LoginPassword property and change its value to the default Administrator user password **EDBDefault**.

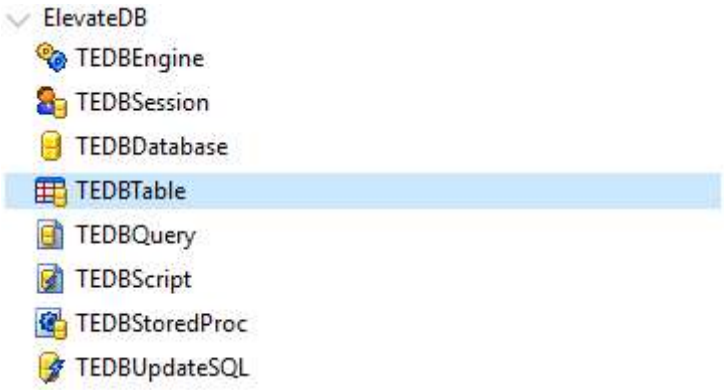
8. Click on the TEDBDatabase component on the ElevateDB group on the tool palette, and then click on the Form1 form. The TEDBDatabase component will be dropped on the form.



9. Hit the F11 key to bring forward the Object Inspector. In the Object Inspector, click on the SessionName property and change its value to **Tutorial**. Click on the DatabaseName property and change its value to **TutorialDB**. Click on the Database property and select the **Tutorial** database that you have already created from the drop-down list.



10. Click on the TEDBTable component on the ElevateDB group on the tool palette, and then click on the Form1 form. The TEDBTable component will be dropped on the form.



11. Hit the F11 key to bring forward the Object Inspector. In the Object Inspector, click on the SessionName property and change its value to **Tutorial**. Click on the DatabaseName property and change its value to **TutorialDB**. Click on the TableName property and change its value to **Customer**. Click on the Active property and change its value to True. If you have followed all of the steps correctly, the Active property should successfully change to True without error.

12. Select the Data Access tab on the tool palette.

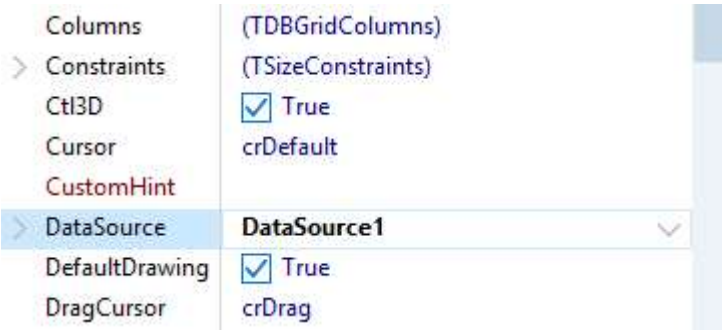
13. Click on the TDataSource component on the Data Access tab on the tool palette, and then click on the Form1 form. The TDataSource component will be dropped on the form.

14. Hit the F11 key to bring forward the Object Inspector. In the Object Inspector, click on the DataSet property and change its value to **EDBTable1**.

15. Select the Data Controls tab on the tool palette.

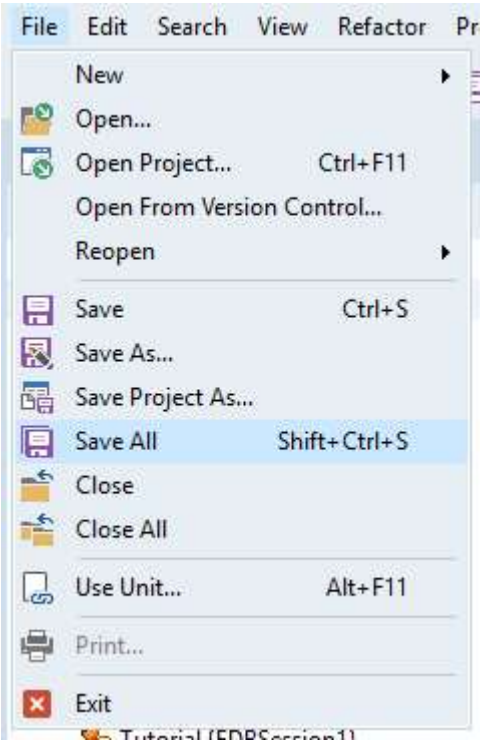
16. Click on the TDBGrid component on the Data Controls tab on the tool palette, and then click on the Form1 form. The TDBGrid component will be dropped on the form. You can use the design-time anchors to resize the TDBGrid component as required on the form.

17. Hit the F11 key to bring forward the Object Inspector. In the Object Inspector, click on the DataSource property and change its value to **DataSource1**.



18. Click on the File option from the main menu.

19. Click on the Save All option from the File menu.



20. Save the project and the main form/unit under the desired names.

You have now successfully created a basic local application for ElevateDB.

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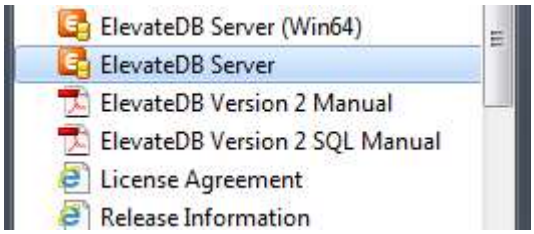
Chapter 2
Client-Server Application Tutorial

2.1 Configuring and Starting the ElevateDB Server

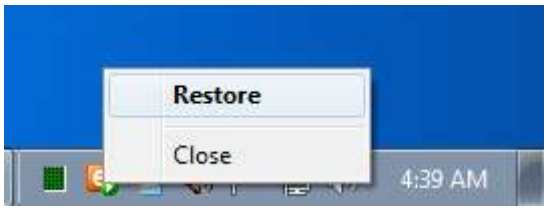
Before creating the tutorial database and application, you must first configure and start the ElevateDB Server.

1. Start the ElevateDB Server (edbsrvr.exe) by clicking on the ElevateDB Server link in the Start menu.

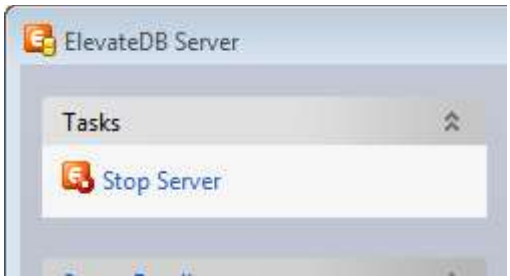


2. Make sure that the server is using the desired character set and configuration file folder (**C:\Tutorial**).

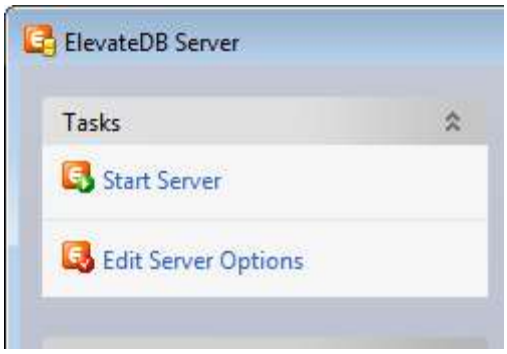
a. In the system tray, right-click on the ElevateDB Server icon to bring up the server menu, and click on the **Restore** option on the server menu.



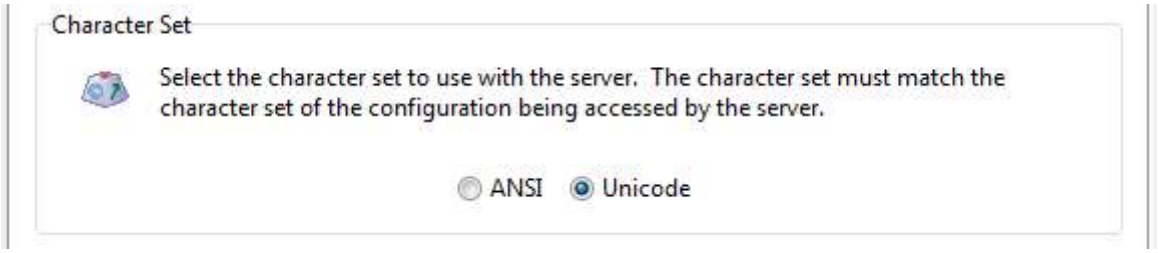
b. In the Tasks pane, click on the **Stop Server** link.



c. In the Tasks pane, click on the **Edit Server Options** link.

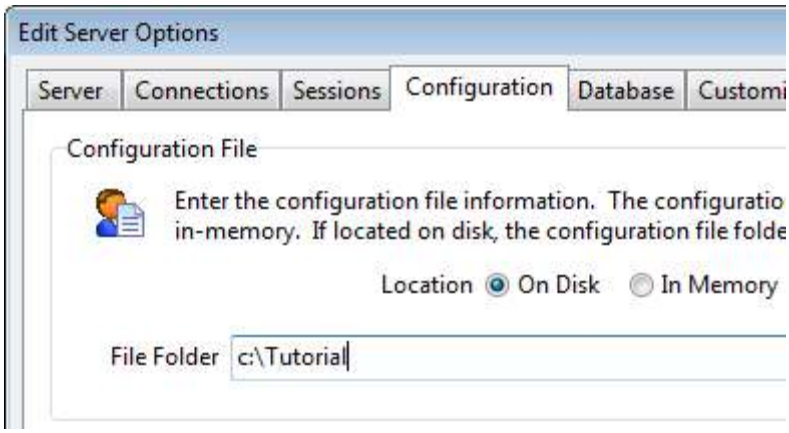


d. On the **Server** page, make sure that the Character Set is set to the desired value - either **ANSI** or **Unicode**.



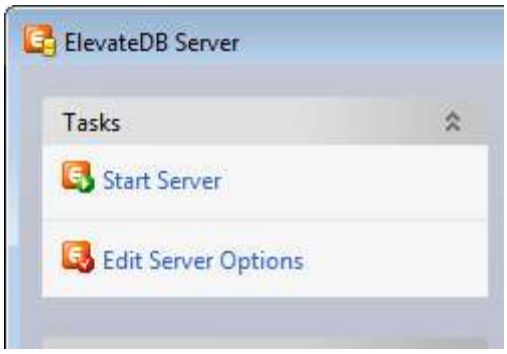
Note
If you're not sure which character set to select and this is the first time using the ElevateDB Server, then leave the character set at the default of Unicode.

e. On the **Configuration** page, make sure that the Configuration File - File Folder is set to the desired folder for the ElevateDB Server configuration file (EDBConfig.EDBCfg).

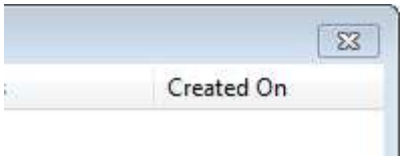


f. Click on the **OK** button.

g. In the Tasks pane, click on the **Start Server** link.



e. Click on the close button in the upper-right-hand corner of the ElevateDB Server window to close the server window.



You have now successfully configured and started the ElevateDB Server.

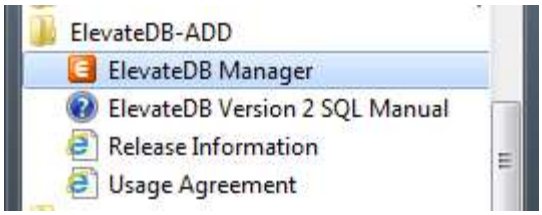
2.2 Creating the Tutorial Database

Before creating the actual tutorial application, you must first create the Tutorial database that will be used in the application. The following steps will guide you through creating the Tutorial database using the ElevateDB Manager.

> **Note**
> It is assumed that you have already configured and started the ElevateDB Server using the steps outlined in the Configuring and Starting the ElevateDB Server topic.

1. Start the ElevateDB Manager (edbmgr.exe) by clicking on the ElevateDB Manager link in the Start menu.

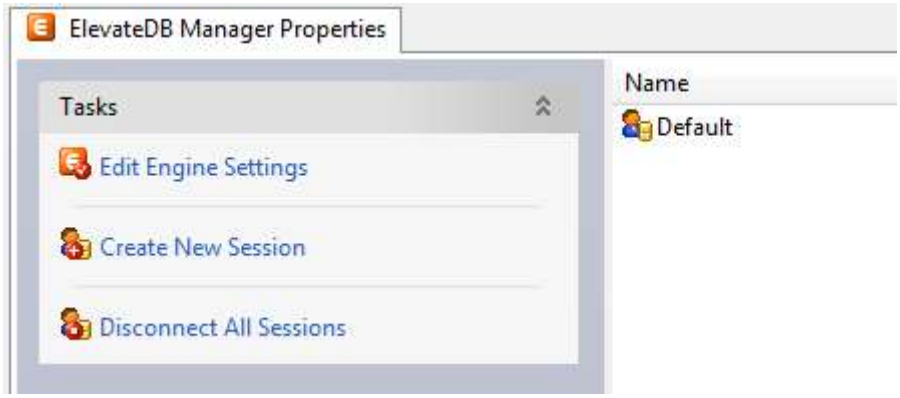
> **Note**
> The ElevateDB Manager is installed with the ElevateDB Additional Software and Utilities (EDB-ADD) installation available from the Downloads page of the web site.



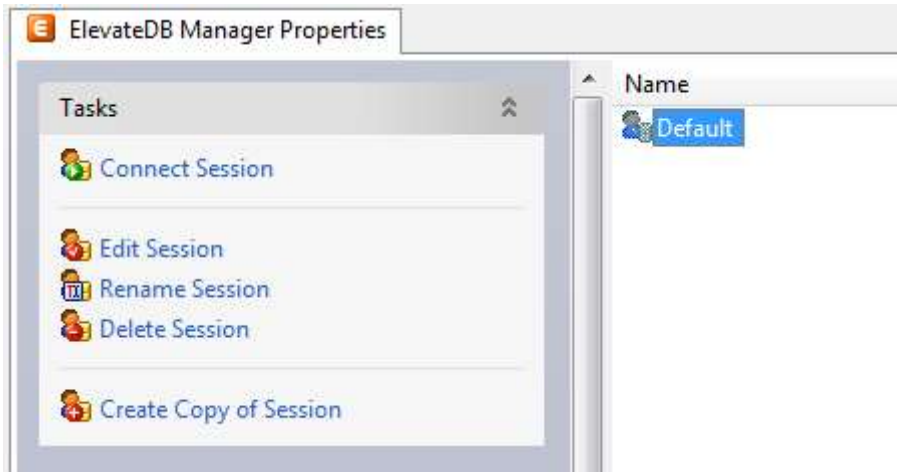
2. Make sure that the session is using the correct session type (**Remote**) and desired character set.

> **Note**
> The character set for the session must match the character set being used by the ElevateDB Server being accessed. Using a different character set will result in you not being able to connect to the ElevateDB Server.

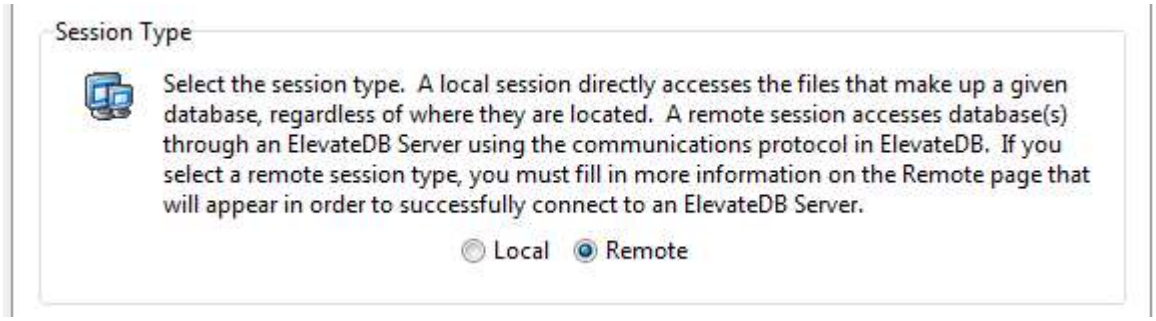
a. Select the **Default** session from the list of available sessions.



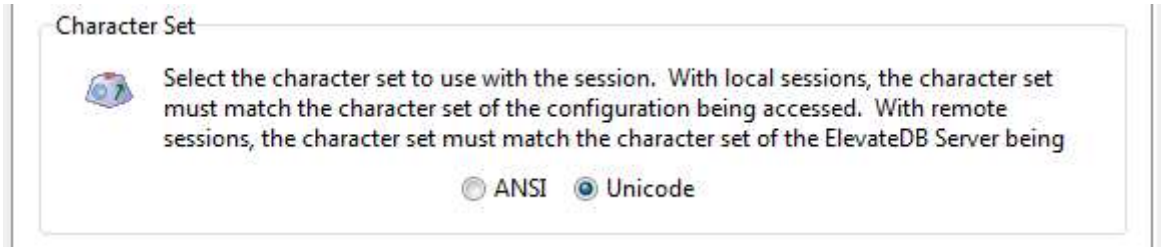
b. In the Tasks pane, click on the **Edit Session** link.



c. On the **General** page of the Edit Session dialog, make sure that the Session Type is set to **Remote**.



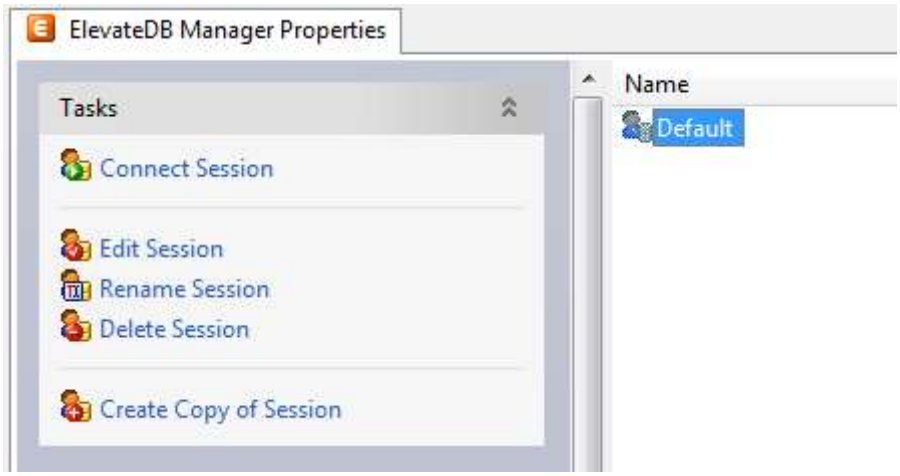
d. On the **General** page of the Edit Session dialog, make sure that the Character Set is set to the desired value - either **ANSI** or **Unicode**.



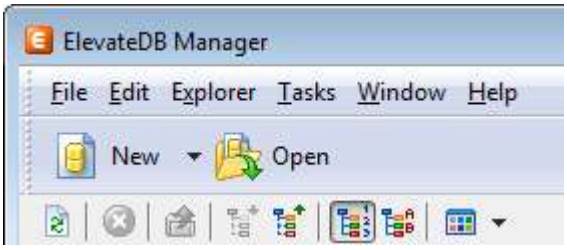
> **Note**
> If you're not sure which character set to select and this is the first time using the ElevateDB Manager, then leave the character set at the default of Unicode.

e. Click on the **OK** button.

3. Double-click on the **Default** session in the Properties window in order to connect the session.



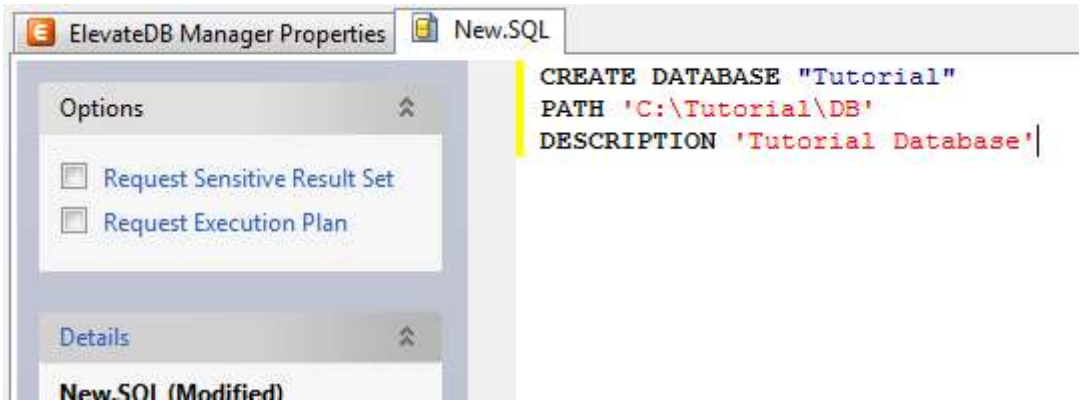
4. Click on the **New** button on the main toolbar.



5. Paste in the following CREATE DATABASE SQL statement in the new SQL window:

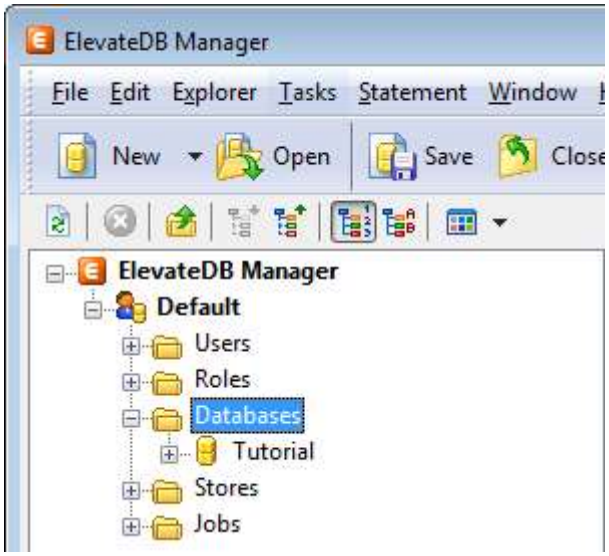
```
CREATE DATABASE "Tutorial"
PATH 'C:\Tutorial\DB'
DESCRIPTION 'Tutorial Database'
```

6. Press the **F9** key to execute the SQL statement.

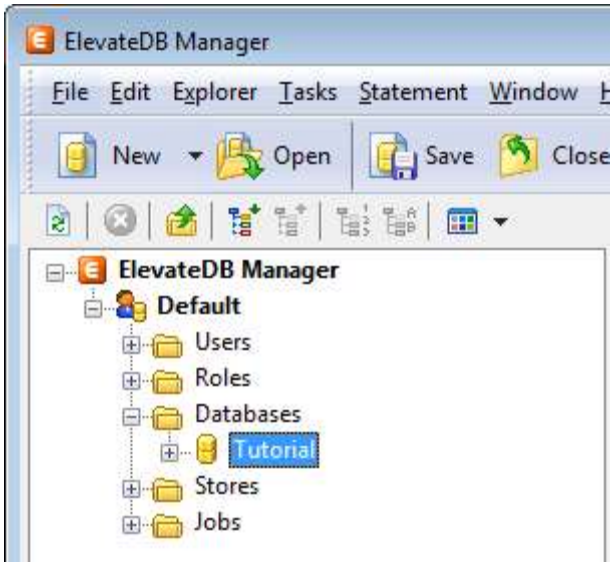


7. Press the **F5** key to refresh the explorer contents for the session.

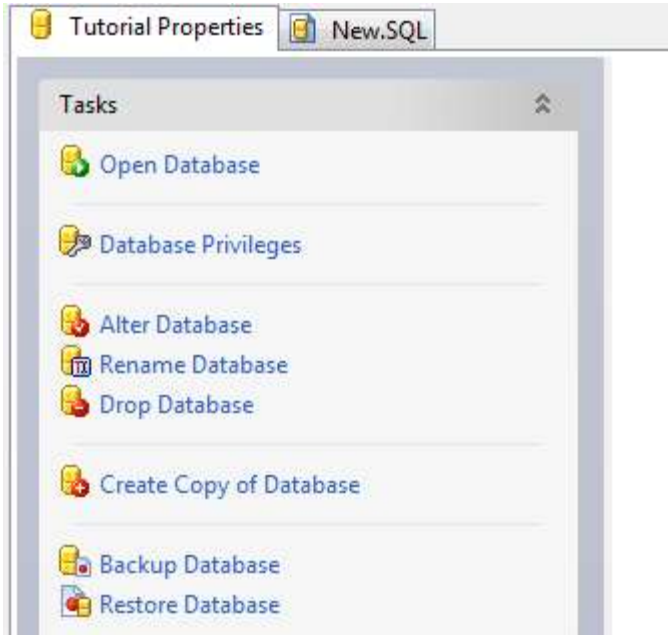
8. Click on the **+** sign next to the **Databases** node in the treeview.



9. Click on the new **Tutorial** database that you just created.



10. Press the **F6** key to make the Properties window the active window, and then click on the **Open Database** link in the Tasks pane.



11. Click on the **New.SQL** tab to bring forward the SQL window.

12. Paste in the following CREATE TABLE SQL statement. If you are using a Unicode session (see Step 2 above), then you should use the Unicode version of the CREATE TABLE statement. If you are using an ANSI session, then you should use the ANSI version of the CREATE TABLE statement:

ANSI

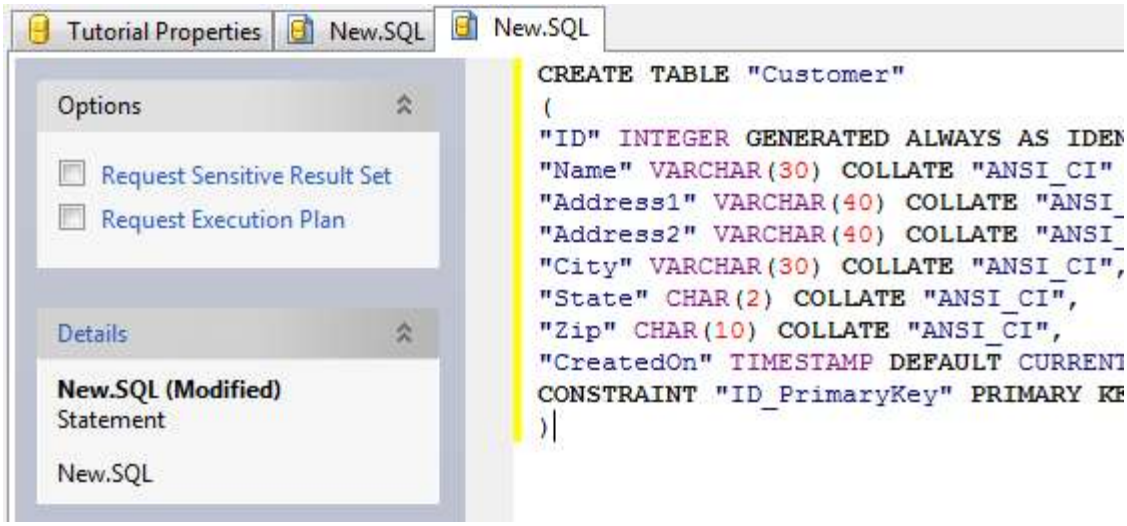
```
CREATE TABLE "Customer"
(
"ID" INTEGER GENERATED ALWAYS AS IDENTITY (START WITH 0, INCREMENT BY 1),
"Name" VARCHAR(30) COLLATE "ANSI_CI" NOT NULL,
"Address1" VARCHAR(40) COLLATE "ANSI_CI",
"Address2" VARCHAR(40) COLLATE "ANSI_CI",
"City" VARCHAR(30) COLLATE "ANSI_CI",
"State" CHAR(2) COLLATE "ANSI_CI",
"Zip" CHAR(10) COLLATE "ANSI_CI",
"CreatedOn" TIMESTAMP DEFAULT CURRENT_TIMESTAMP,
CONSTRAINT "ID_PrimaryKey" PRIMARY KEY ("ID")
)
```

Unicode

```
CREATE TABLE "Customer"
(
"ID" INTEGER GENERATED ALWAYS AS IDENTITY (START WITH 0, INCREMENT BY 1),
"Name" VARCHAR(30) COLLATE "UNI_CI" NOT NULL,
"Address1" VARCHAR(40) COLLATE "UNI_CI",
"Address2" VARCHAR(40) COLLATE "UNI_CI",
"City" VARCHAR(30) COLLATE "UNI_CI",
"State" CHAR(2) COLLATE "UNI_CI",
"Zip" CHAR(10) COLLATE "UNI_CI",
"CreatedOn" TIMESTAMP DEFAULT CURRENT TIMESTAMP,
```

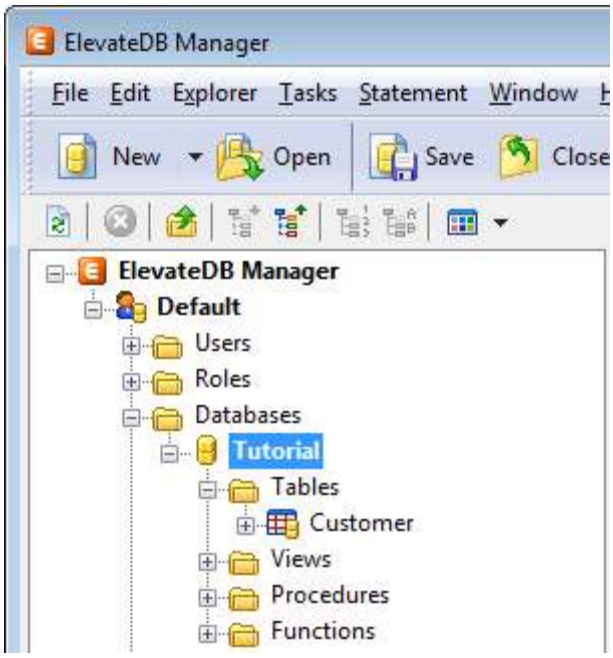
```
CONSTRAINT "ID_PrimaryKey" PRIMARY KEY ("ID")
)
```

13. Press the **F9** key to execute the SQL statement.



14. Press the **F5** key to refresh the explorer contents for the session.

15. The table should now show up in the list of tables for the Tutorial database.



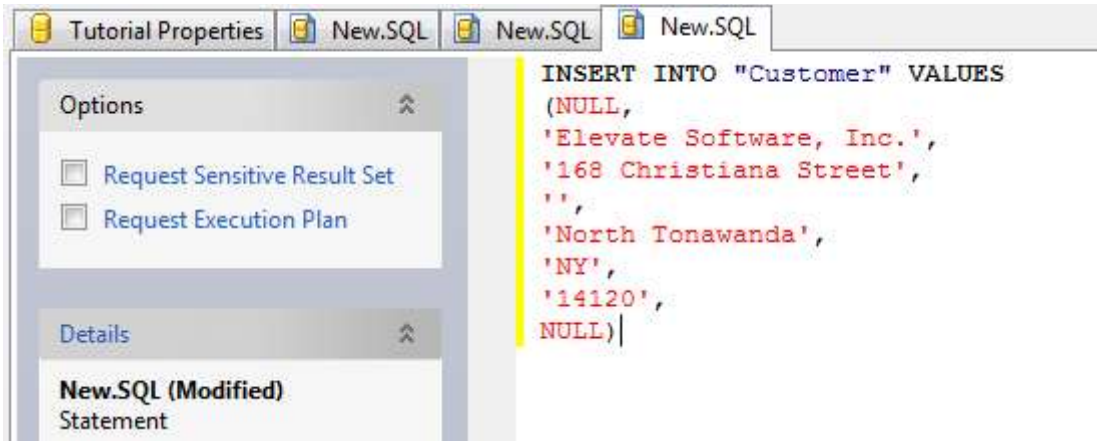
16. Click on the **New.SQL** tab to bring forward the SQL window.

17. Paste in the following INSERT SQL statement:

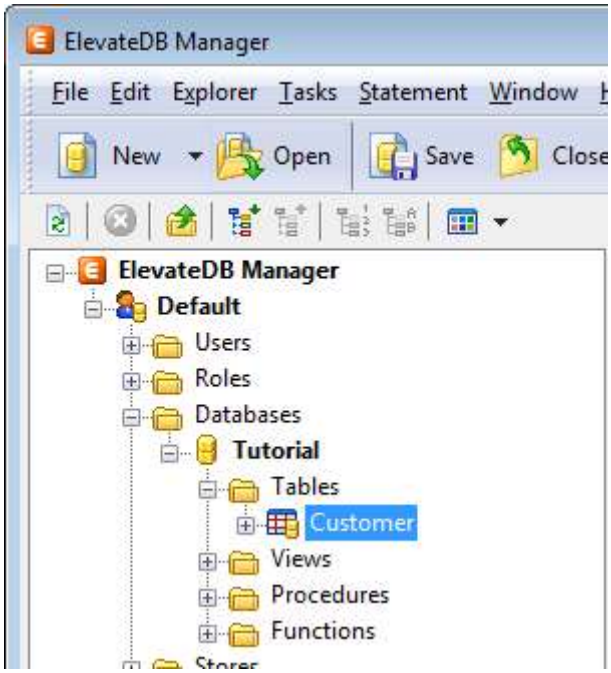
```
INSERT INTO "Customer" VALUES
(NULL,
```

```
'Elevate Software, Inc.',
'168 Christiana Street',
'',
'North Tonawanda',
'NY',
'14120',
NULL)
```

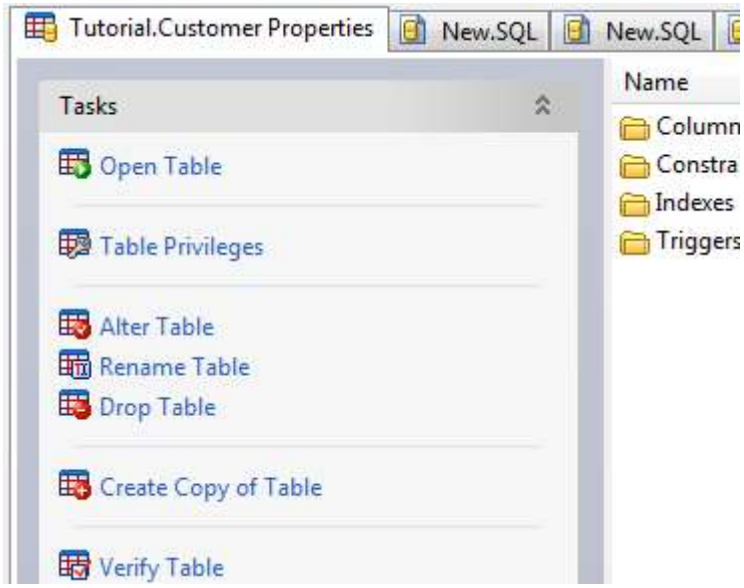
18. Press the **F9** key to execute the SQL statement.



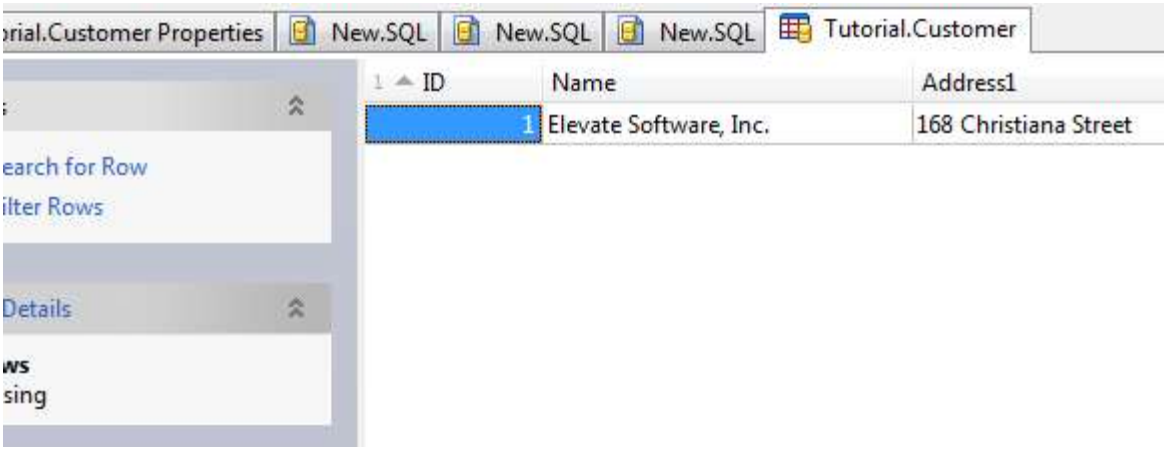
19. Click on the **Customer** table that you just created.



20. Press the **F6** key to make the Properties window the active window, and then click on the **Open Table** link in the Tasks pane.



21. You will now see the row that you just inserted.



You have now successfully created the Tutorial database.

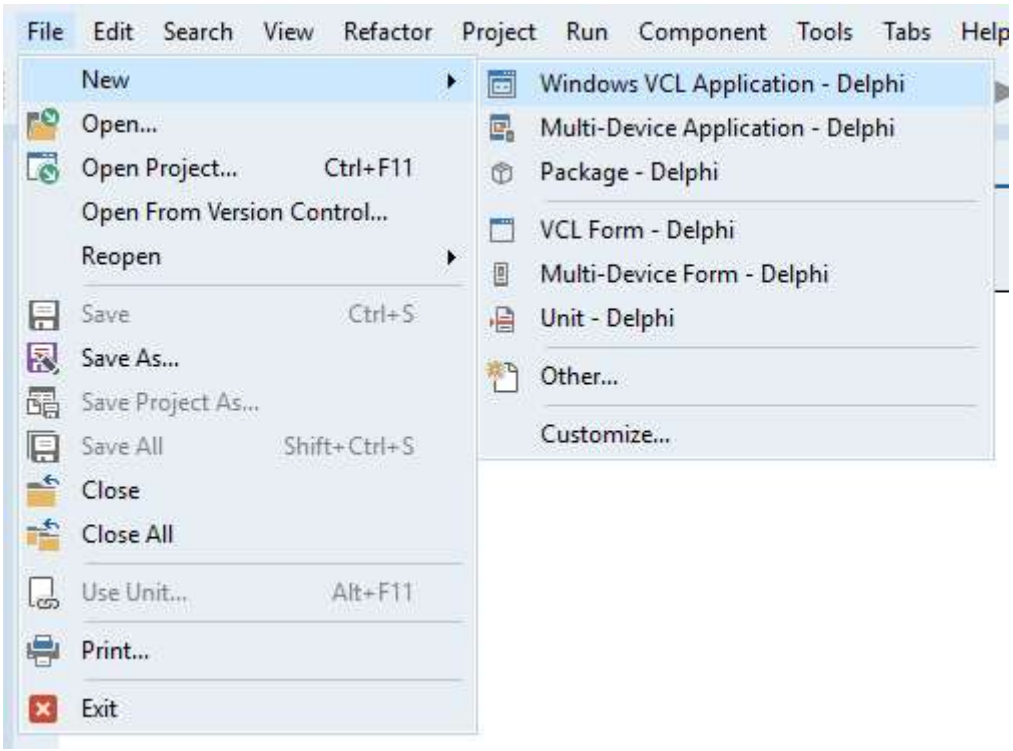
2.3 Creating the Application

The following steps will guide you through creating a basic client-server application using ElevateDB.

> **Note**
> It is assumed that you have already created the required database using the steps outlined in the Creating the Tutorial Database topic, and have configured and started the ElevateDB Server using the steps outlined in the Starting and Configuring the ElevateDB Server topic.

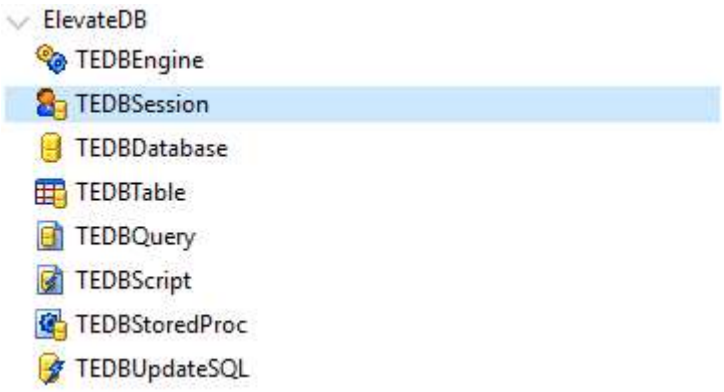
1. Click on the File option from the main menu.

2. Click on the New option from the File menu, and click on the VCL Forms Application - Delphi option from the New sub-menu.



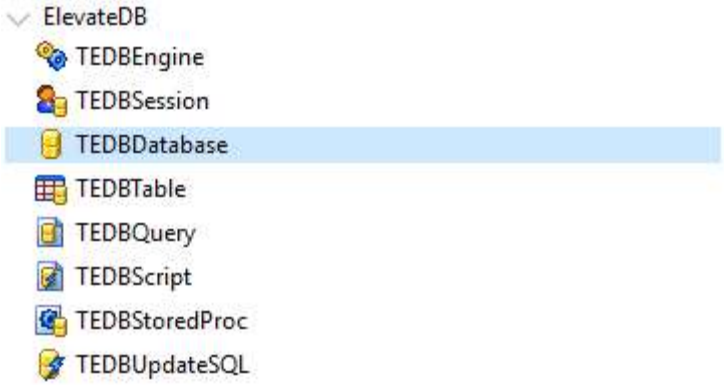
3. Select the ElevateDB group on the tool palette and click on the plus (+) sign to expand the ElevateDB group of components.

4. Click on the TEDBSession component on the ElevateDB group on the tool palette, and then click on the Form1 form. The TEDBSession component will be dropped on the form.

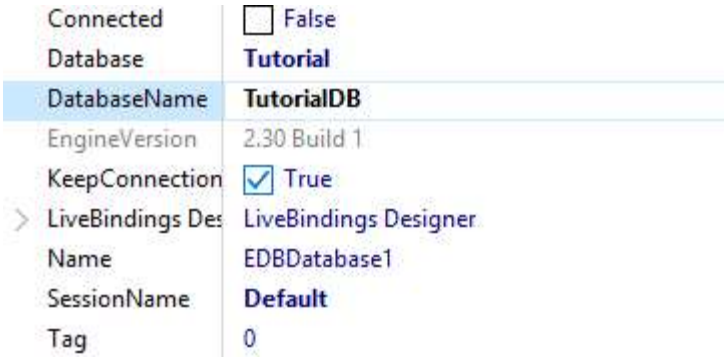


5. Hit the F11 key to bring forward the Object Inspector. In the Object Inspector, click on the SessionName property and change its value to **Tutorial**, click on the SessionType property and change its value to **stRemote**, click on the LoginUser property and change its value to the default administrator user name **Administrator**, and click on the LoginPassword property and change its value to the default Administrator user password **EDBDefault**. Make sure that the RemoteAddress property is set to **127.0.0.1** (the default) and that the RemotePort property is set to **12010** (the default).

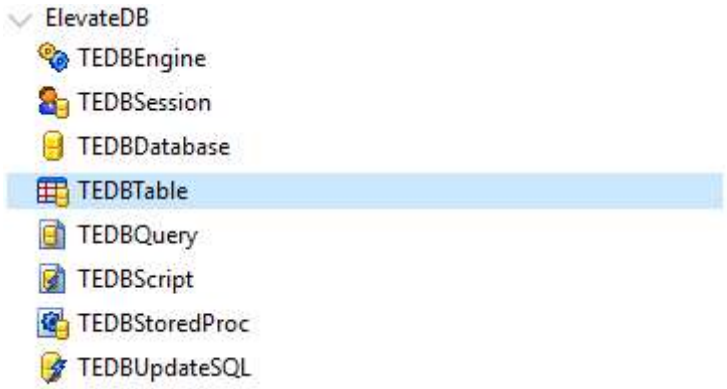
6. Click on the TEDBDatabase component on the ElevateDB group on the tool palette, and then click on the Form1 form. The TEDBDatabase component will be dropped on the form.



7. Hit the F11 key to bring forward the Object Inspector. In the Object Inspector, click on the SessionName property and change its value to **Tutorial**. Click on the DatabaseName property and change its value to **TutorialDB**. Click on the Database property and select the Tutorial database that you have already created from the drop-down list.



8. Click on the TEDBTable component on the ElevateDB group on the tool palette, and then click on the Form1 form. The TEDBTable component will be dropped on the form.



9. Hit the F11 key to bring forward the Object Inspector. In the Object Inspector, click on the SessionName property and change its value to **Tutorial**. Click on the DatabaseName property and change its value to **TutorialDB**. Click on the TableName property and change its value to **Customer**. Click on the Active property and change its value to **True**. If you have followed all of the steps correctly, the Active property should successfully change to True without error.

10. Select the Data Access tab on the tool palette.

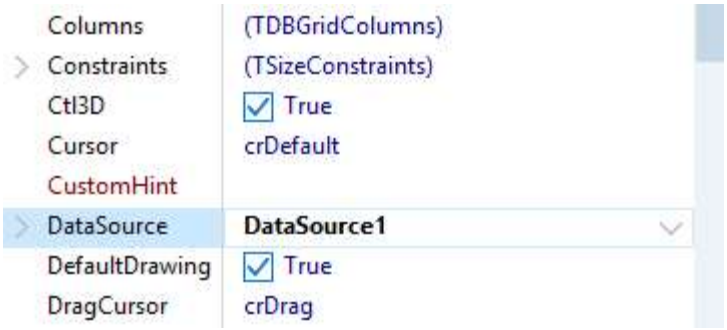
11. Click on the TDataSource component on the Data Access tab on the tool palette, and then click on the Form1 form. The TDataSource component will be dropped on the form.

12. Hit the F11 key to bring forward the Object Inspector. In the Object Inspector, click on the DataSet property and change its value to **EDBTable1**.

13. Select the Data Controls tab on the tool palette.

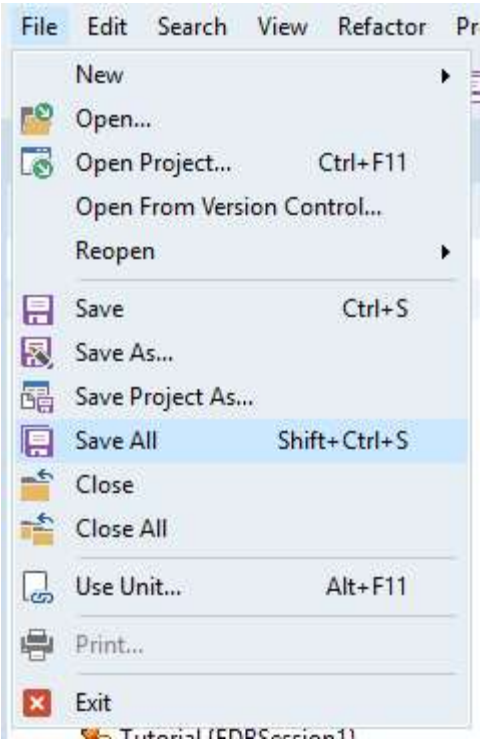
14. Click on the TDBGrid component on the Data Controls tab on the tool palette, and then click on the Form1 form. The TDBGrid component will be dropped on the form. You can use the design-time anchors to resize the TDBGrid component as required on the form.

15. Hit the F11 key to bring forward the Object Inspector. In the Object Inspector, click on the DataSource property and change its value to **DataSource1**.



16. Click on the File option from the main menu.

17. Click on the Save All option from the File menu.



18. Save the project and the main form/unit under the desired names.

You have now successfully created a basic client-server application for ElevateDB.

Chapter 3
DBISAM Migration

3.1 Introduction

Migrating an existing DBISAM application to ElevateDB is a 3-step process that is outlined below:

Step 1 - Migrating a DBISAM Database Using the ElevateDB Manager or Migrating a DBISAM Database Using Code

The first step is to migrate the existing DBISAM database (or databases) to ElevateDB format. This can be accomplished interactively via the ElevateDB Manager or via the MIGRATE DATABASE statement.

Step 2 - Renaming the DBISAM Components

The second step is to rename any existing DBISAM components in the application to their ElevateDB counterparts. This can be accomplished manually in the Delphi, C++Builder, Borland Developer Studio, CodeGear RAD Studio, Embarcadero RAD Studio, or Lazarus IDE.

Step 3 - Updating the Source Code

The third step is to update the application source code so that it uses the new ElevateDB components. This the most involved step of the migration process.

3.2 Migrating a DBISAM Database Using the ElevateDB Manager

The following steps will guide you through migrating a database from another format to ElevateDB format using the ElevateDB Manager.

1. The migrator modules provided with ElevateDB are:

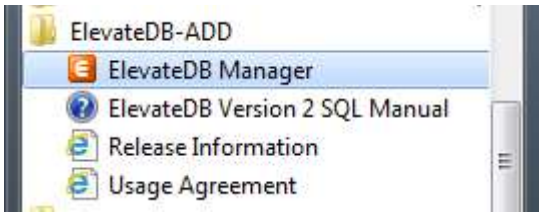
Module	Description
edbmigrate	ElevateDB migrator module
edbmigratedbisam1	DBISAM Version 1.x migrator module
edbmigratedbisam2	DBISAM Version 2.x migrator module
edbmigratedbisam3	DBISAM Version 3.x migrator module
edbmigratedbisam4	DBISAM Version 4.x migrator module
edbmigratebde	BDE (Borland Database Engine) migrator module
edbmigrateado	ADO (Microsoft ActiveX Data Objects) migrator module
edbmigratendb	NexusDB migrator module
edbmigrateads	ADS (Advantage Database Server) migrator module

You can find these migrator modules as part of the ElevateDB Additional Software and Utilities (EDB-ADD) installation in the \libs subdirectory under the main installation directory. There are ANSI and Unicode versions of each of the migrator modules that will work with both ANSI or Unicode sessions, and the ElevateDB Manager will automatically select the correct migrator modules for the session being used.

> **Note**
> You can download the ElevateDB Additional Software and Utilities (EDB-ADD) installation from the Downloads page of the web site.

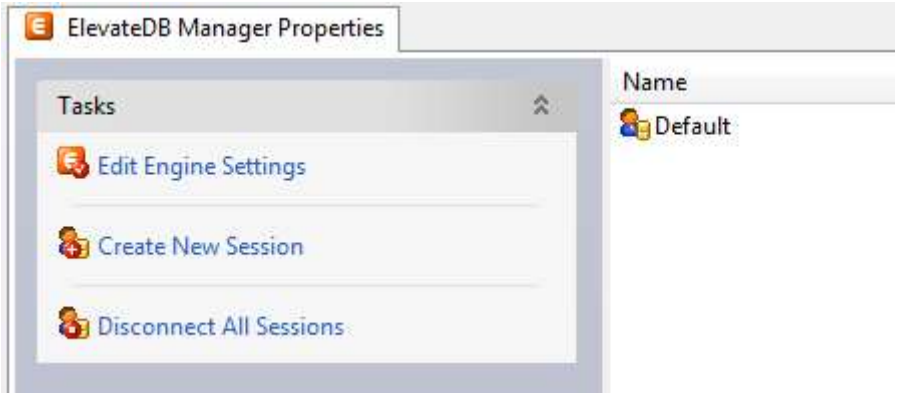
2. Start the ElevateDB Manager (edbmgr.exe).

> **Note**
> You can find the ElevateDB Manager as part of the ElevateDB Additional Software and Utilities (EDB-ADD) installation available from the Downloads page of the web site.

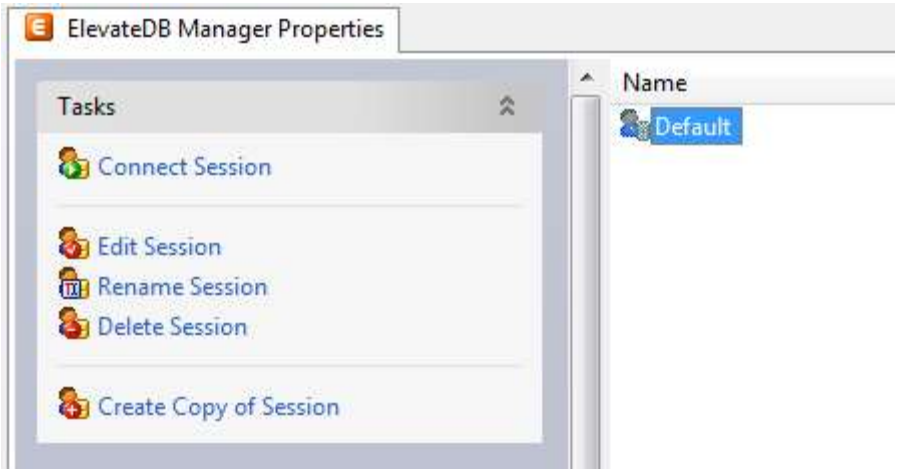


3. Make sure that the session is using the desired character set and configuration file folder (**C:\Tutorial**).

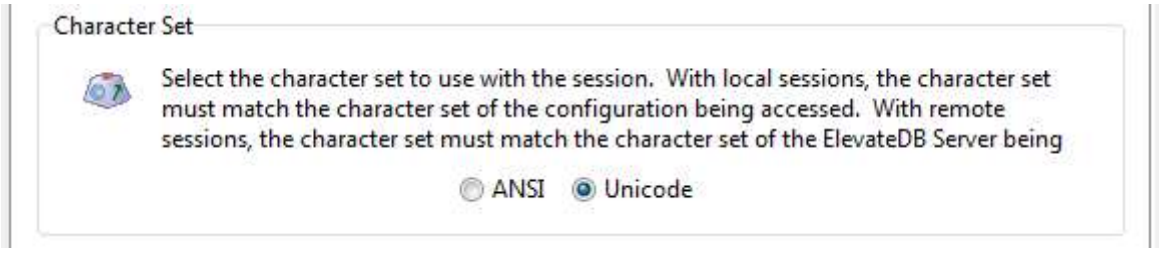
a. Select the **Default** session from the list of available sessions.



b. In the Tasks pane, click on the **Edit Session** link.

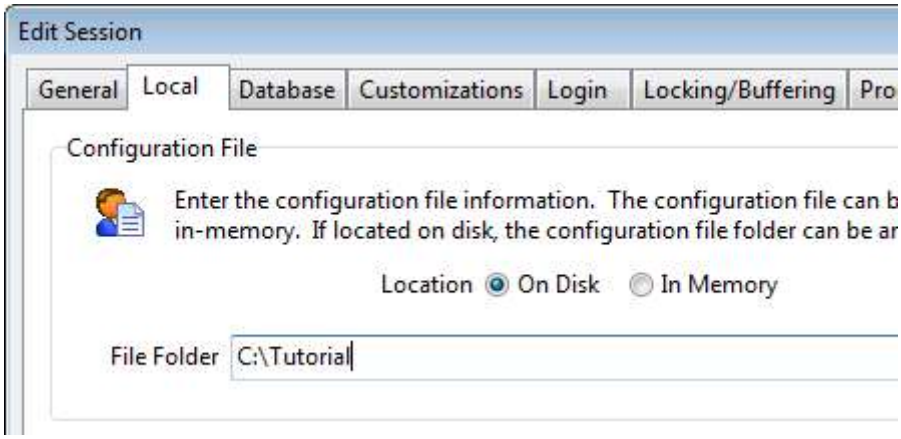


c. On the **General** page of the Edit Session dialog, make sure that the Character Set is set to the desired value - either **ANSI** or **Unicode**.



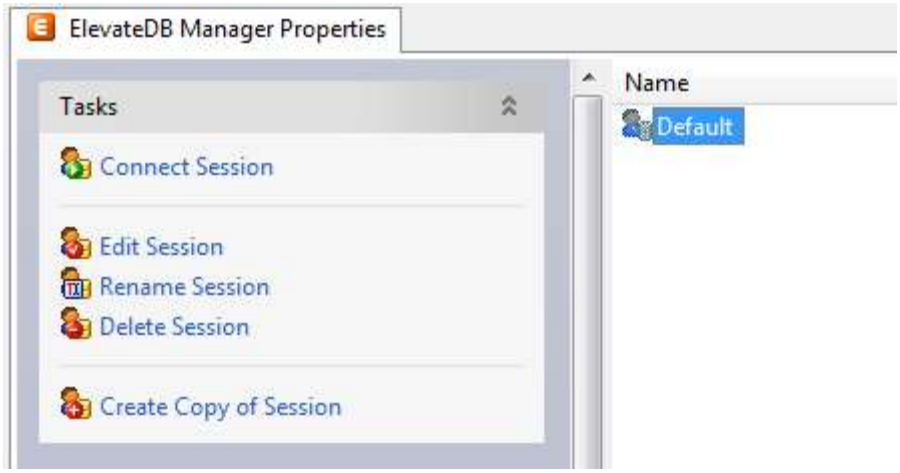
> **Note**
> If you're not sure which character set to select and this is the first time using the ElevateDB Manager, then leave the character set at the default of Unicode.

d. On the **Local** page of the Edit Session dialog, make sure that the Configuration File - File Folder is set to the desired folder.

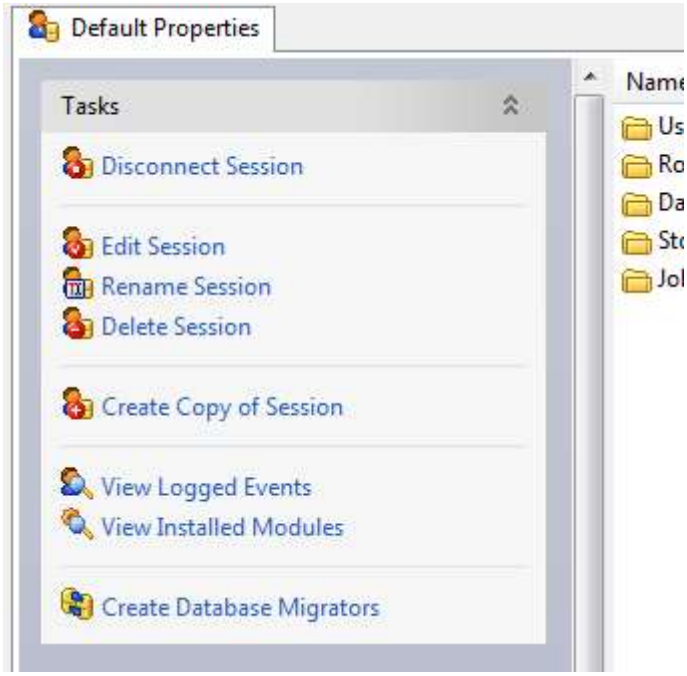


e. Click on the **OK** button.

4. Double-click on the **Default** session in the Properties window in order to connect the session.

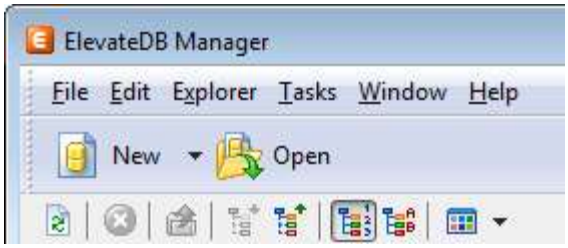


5. In the Tasks pane, click on the **Create Database Migrators** link. This will automatically create all of the database migrators that are shipped with the ElevateDB Manager.



Note
If the character set of the session is changed in the future (Step 3 above), just re-execute this step in the ElevateDB Manager and the database migrators will be updated so that they use the correct migrator modules that match the character set of the session.

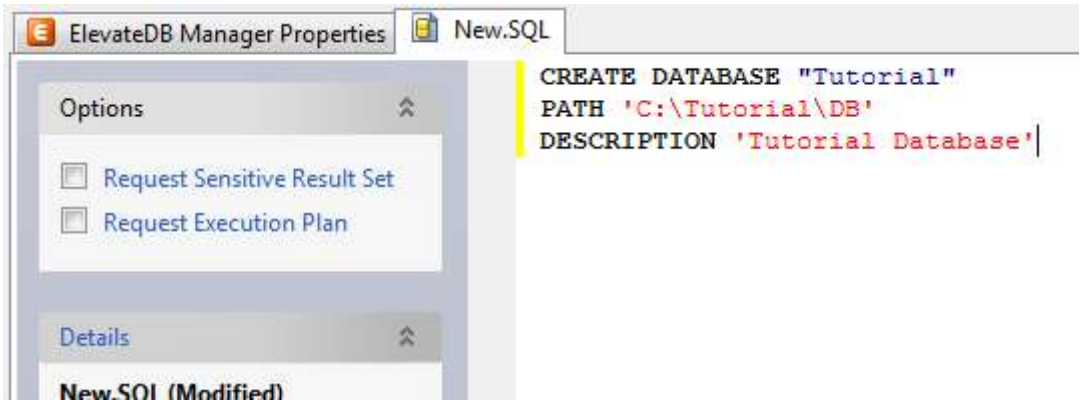
6. Click on the **New** button on the main toolbar.



7. Paste in the following CREATE DATABASE SQL statement in the new SQL window:

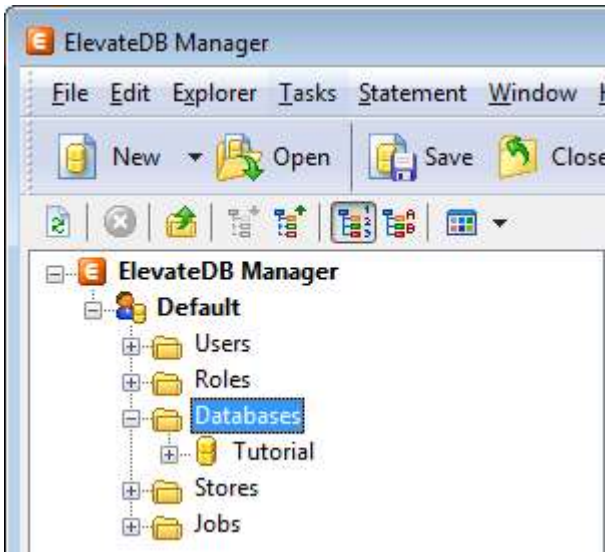
```
CREATE DATABASE "Tutorial"
PATH 'C:\Tutorial\DB'
DESCRIPTION 'Tutorial Database'
```

8. Press the **F9** key to execute the SQL statement.

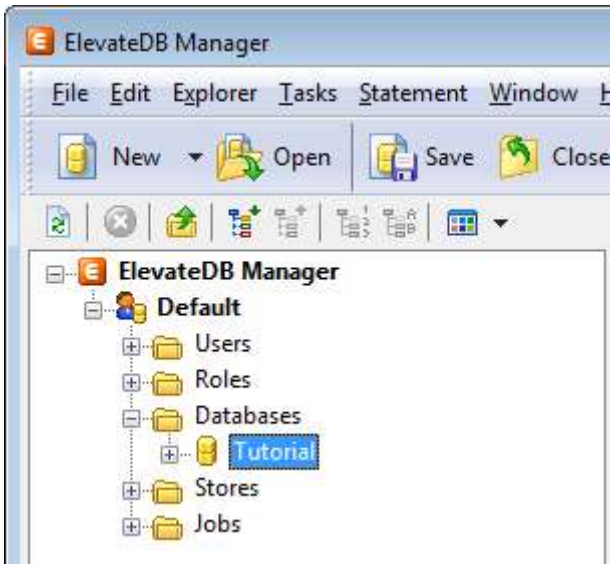


9. Press the **F5** key to refresh the explorer contents for the session.

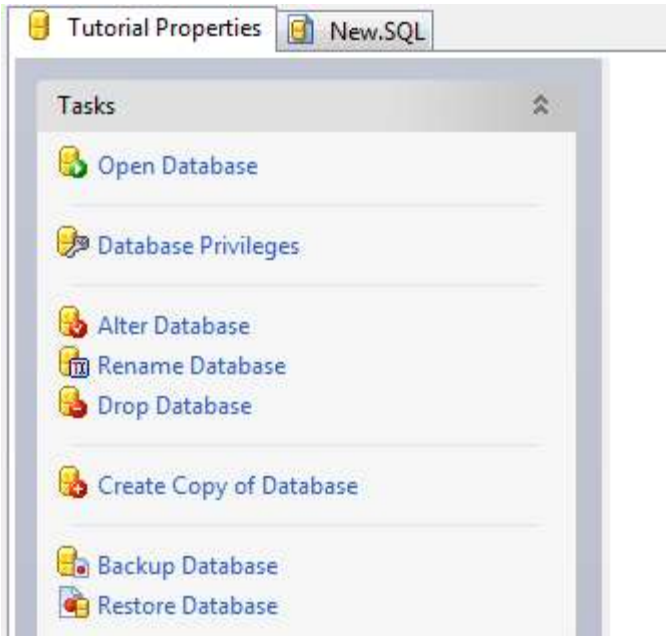
10. Click on the **+** sign next to the **Databases** node in the treeview.



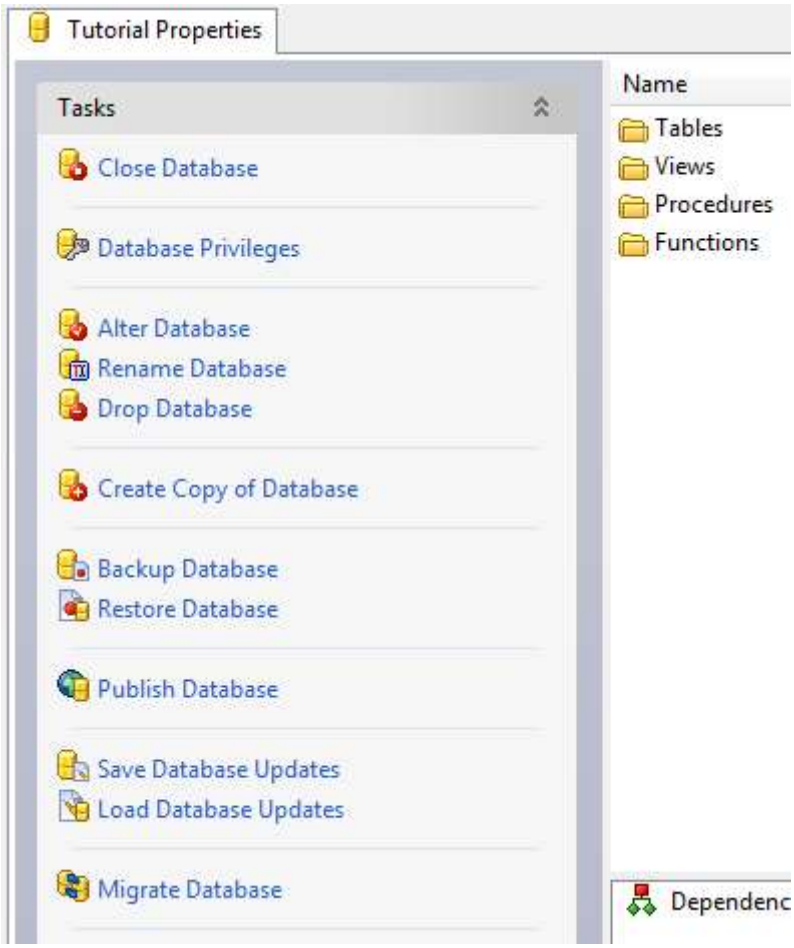
11. Click on the new **Tutorial** database that you just created.



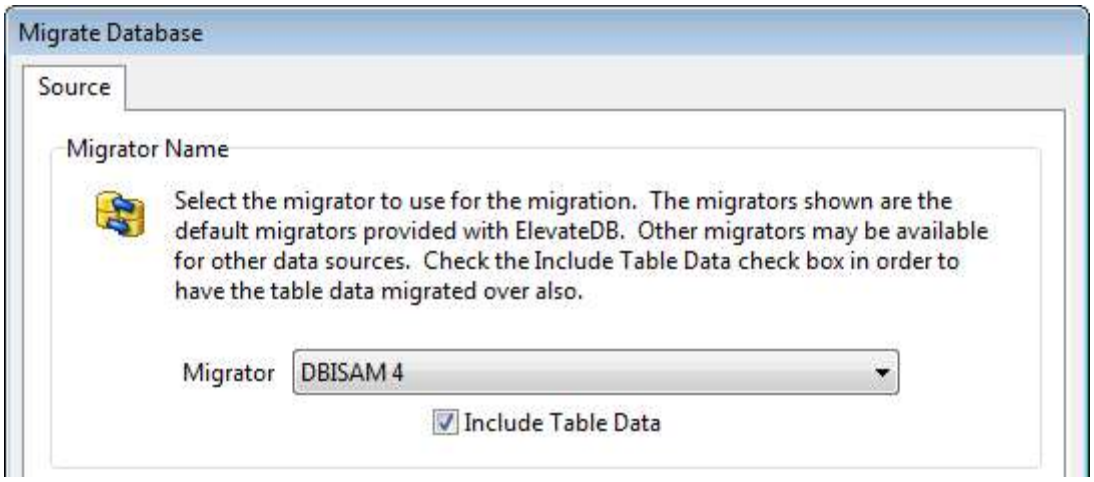
12. Press the **F6** key to make the Properties window the active window, and then click on the **Open Database** link in the Tasks pane.



13. Click on the **Migrate Database** link in the Tasks pane for the database.



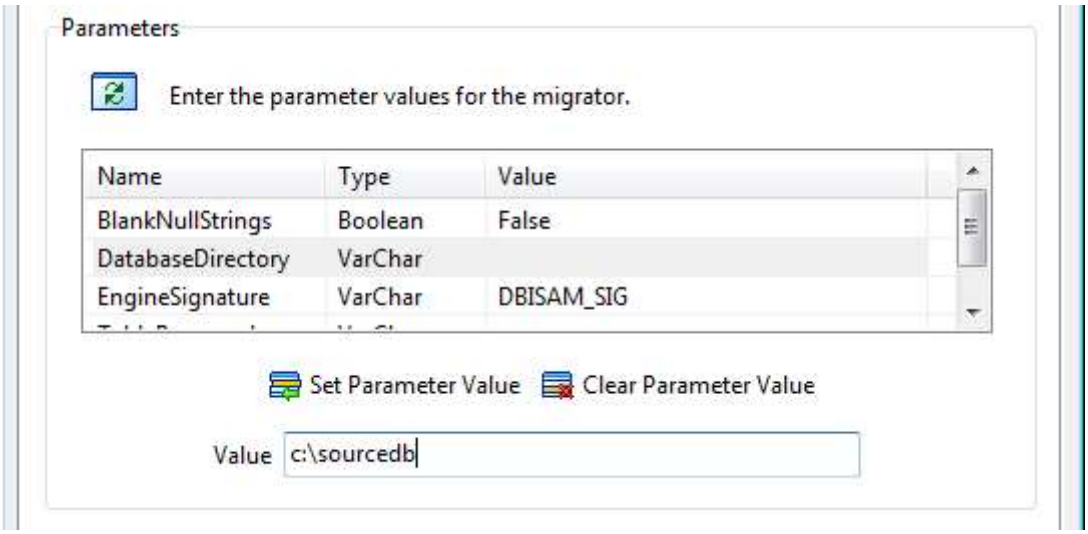
14. Select the desired migrator from the list of migrators.



15. Each migrator will have various parameters that control how the migration process executes, and these parameters are expressed in terms that are easily understood. Usually, at a minimum, the source database name or directory parameter will need to be set. To set the source database parameters:

a. Click on the desired parameter in the list of parameters.

b. Type in the parameter value in the parameter edit control, and click on the **Set Parameter** button.



15. Click on the **OK** button, and the migration process will begin and progress information will be present in the bottom status bar of the ElevateDB Manager.

You have now successfully migrated your database to ElevateDB.

3.3 Migrating a DBISAM Database Using Code

The following steps will guide you through migrating a database from DBISAM format to ElevateDB format using the DBISAM migrators provided with ElevateDB.

1. Make sure that the DBISAM migrator modules (DLLs) are registered in the configuration file. The DBISAM migrator modules provided with ElevateDB are:

Module	Description
edbmigratedbisam1	DBISAM Version 1.x migrator module
edbmigratedbisam2	DBISAM Version 2.x migrator module
edbmigratedbisam3	DBISAM Version 3.x migrator module
edbmigratedbisam4	DBISAM Version 4.x migrator module

You can find these migrator modules as part of the ElevateDB additional software (EDB-ADD) installation in the \libs subdirectory under the main installation directory. There are ANSI and Unicode versions of each of the migrator modules that will work with both ANSI or Unicode sessions.

Note
You can download the ElevateDB Additional Software and Utilities (EDB-ADD) installation from the Downloads page of the web site.

In order to register the required DBISAM migrator module(s), use the CREATE MODULE statement. You can use the TEDBSession Execute method to execute the statement:

```
// This example uses the default Session
// component to register the migrator module using the
// Execute method

with Session do
   Execute('CREATE MODULE "DBISAM4" '+
           'PATH ''C:\Program Files\ElevateDB 2
      ADD\libs\edbmigratedbisam4\unicode\win32\edbmigratedbisam4.dll'''+
           'DESCRIPTION ''DBISAM 4 Migrator''');
```

2. Create a migrator for the desired migrator module using the CREATE MIGRATOR statement. You can use the TEDBSession Execute method to execute the statement:

```
// This example uses the default Session
// component to create the migrator using the
// Execute method

with Session do
   Execute('CREATE MIGRATOR "DBISAM4" '+
           'MODULE "DBISAM4" '+
           'DESCRIPTION ''DBISAM 4 Migrator''');
```

Note
It's important that the MODULE referenced in the CREATE MIGRATOR statement matches the module that you registered first with the CREATE MODULE statement. You'll need to execute both statements for each migrator that you want to use with ElevateDB.

3. If necessary, create the ElevateDB database to use as the target database for the migration using the CREATE DATABASE statement. If you have already created the database or the database already exists, then you can skip this step. You can use the TEDBSession Execute method to execute the statement:

```
// This example uses the default Session
// component to create the database using the
// Execute method

with Session do
   Execute('CREATE DATABASE MyDatabase '+
           'PATH ''c:\mydatabase''');
```

4. Execute the MIGRATE DATABASE statement from the ElevateDB database that you just created, or that already existed. You can use the TEDBDatabase Execute method to execute the statement:

```
// This example uses an existing TEDBDatabase
// component to migrate the database using the
// Execute method

with MyDatabase do
   begin
   DatabaseName:='MyDatabase';
   Database:='MyDatabase';
   Execute('MIGRATE DATABASE FROM "DBISAM4" '+
           'USING DatabaseDirectory = ''c:\dbisamdata'''+
           'WITH DATA');
   end;
```

When the MIGRATE DATABASE statement is executed, the source DBISAM database directory should migrate to the current ElevateDB database. If you would like to display status and progress information during the migration, you can attach event handlers to the TEDBDatabase OnStatusMessage and OnProgress events.

3.4 Renaming the DBISAM Components

The ElevateDB VCL component set for the Delphi, C++Builder, Borland Developer Studio, CodeGear RAD Studio, Embarcadero RAD Studio, and Lazarus products are very similar to their DBISAM counterparts. Therefore, it is possible to simply edit the form files in the IDE and modify the names of the components and their published properties and events so that they will use the ElevateDB components instead.

Updating Components on a Form or Data Module

The following steps will allow you to modify the DBISAM components on a form or data module so that they are compatible with ElevateDB:

> **Warning**
> It is possible to corrupt a form file or otherwise cause the loss of components by not properly completing the following steps. Please be very careful when editing a form file as text and make sure that all defined objects are structured properly.

1. With the form or data module open in the IDE, press the Alt-F12 keys. This will open the form in text mode.

2. Modify the components and their published properties and events as required. Objects are always structured as:

```
object <ObjectName>
<Property or Event Definition>
[<Property or Event Definition>]
[<Property or Event Definition>]
end

<Property or Event Definition> =

<Property or Event Name> = <Value>
```

Collection properties are defined as:

```
<Property or Event Name> = <
<ItemDefinition>
[<ItemDefinition>]
[<ItemDefinition>]
>

<ItemDefinition> =

item
<Property or Event Definition>
[<Property or Event Definition>]
[<Property or Event Definition>]
end
```

3. Press the Alt-F12 keys to return the form to design mode. If there are any properties or events still defined that don't belong to any of the new ElevateDB components, then you will receive a warning and be prompted to remove them from the form definition. Ideally, if you have edited the form entirely so that all published properties and events reflect the new ElevateDB components, you will not receive any errors or warnings.

Component Changes

Detailed information regarding the changes in the existing DBISAM components can be found in the Component Changes topic.

3.5 Updating the Source Code

Updating the source code for an existing DBISAM application so that it works with ElevateDB is a 3-step process that is outlined below:

Step 1 - Rename All Component References

The first step is to rename all component references so that they are using the new ElevateDB component names. You can find information on the component name changes in the Component Changes topic.

Step 2 - Modify All Property, Method, and Event References

The second step is to modify all property, method, and event references so that they are using the new ElevateDB properties, methods, and events. You can find information on the changes to the properties, methods, and events in the Component Changes topic. In many cases you will find that ElevateDB requires an SQL statement to be executed in place of what used to be a method call in DBISAM.

Step 3 - Modify All SQL Statements

The third and final step is to modify all existing DBISAM SQL statements so that they use the new ElevateDB syntax. You can find information on the differences in the SQL implementations of DBISAM and ElevateDB in the SQL Changes topic.

3.6 Component Changes

The following is the list of components in DBISAM and their counterpart in ElevateDB. Click on each component name to find out the changes to the properties, methods, and events for the component.

DBISAM Component	ElevateDB Component
TDBISAMEngine	TEDBEngine
TDBISAMSession	TEDBSession
TDBISAMDatabase	TEDBDatabase
TDBISAMDataSet	TEDBDataSet
TDBISAMDBDataSet	TEDBDBDataSet
TDBISAMTable	TEDBTable
TDBISAMQuery	TEDBQuery
None	TEDBStoredProc
TDBISAMUpdateSQL	TEDBUpdateSQL
EDBISAMEngineError	EEDBError

3.7 TDBISAMEngine Component

Removed Properties, Methods and Events

The following are the properties, methods, and events that have been removed for the component:

Properties

Removed	Description
CreateTempTablesInDatabase	This property is no longer necessary. ElevateDB always creates temporary tables used in optimizing, repairing, or altering tables in the same location as the tables themselves.
FilterRecordCounts	This property is no longer necessary. ElevateDB does not provide logical record numbers (sequence numbers).
Functions	This property is no longer necessary. ElevateDB uses SQL to create and drop functions, and a special Information Schema for storing the available functions in a given database. Please see the CREATE FUNCTION, DROP FUNCTION, and Functions Table topics for more information.
MaxTableBlobBufferCount MaxTableBlobBufferSize MaxTableDataBufferCount MaxTableDataBufferSize MaxTableIndexBufferCount MaxTableIndexBufferSize	These properties are no longer necessary. ElevateDB allows the buffering settings to be set on a per-table basis for each table when the table is created or altered. Please see the CREATE TABLE, ALTER TABLE, and Tables Table topics for more information.
ServerAdminAddress ServerAdminPort ServerAdminThreadCacheSize	These properties are no longer necessary. ElevateDB uses one port for both normal connections and administrative connections, and both types of operations can be performed using only one connection.
ServerConfigPassword	This property is no longer necessary. ElevateDB uses one encryption password per application for all encryption, and it is represented by the EncryptionPassword property.
TableBlobBackupExtension TableBlobTempExtension TableBlobUpgradeExtension TableDataBackupExtension TableDataTempExtension TableDataUpgradeExtension TableIndexBackupExtension TableIndexTempExtension TableIndexUpgradeExtension	These properties have been removed and replaced with the hard-coded value of ".Old". ElevateDB simply appends the ".Old" to the existing file when creating backup copies during the optimization, alteration, or repair of tables.
TableFilterIndexThreshhold	This property is no longer required under ElevateDB and has been removed.
TableMaxReadLockCount	This property is no longer necessary. For performance reasons, ElevateDB does not relinquish read locks when performing table scans in order to satisfy a query or filter condition.

TableReadLockTimeout TableTransLockTimeout TableWriteLockTimeout	These properties are no longer required under ElevateDB and have been removed

Methods

Removed	Description
AddServerDatabase ModifyServerDatabase DeleteServerDatabase GetServerDatabase GetServerDatabaseNames	These methods are no longer necessary. ElevateDB uses SQL to create and drop databases, and a special Configuration database for storing the available databases in a given configuration. Please see the CREATE DATABASE, DROP DATABASE, and Databases Table topics for more information.
AddServerDatabaseUser ModifyServerDatabaseUser DeleteServerDatabaseUser GetServerDatabaseUser GetServerDatabaseUserNames	These methods are no longer necessary. ElevateDB uses SQL to create and drop users and roles, and a special Configuration database for storing the available users and roles in a given configuration. ElevateDB also uses SQL for granting and revoking privileges on databases and other objects for existing users and roles. Please see the CREATE USER, DROP USER, CREATE ROLE, DROP ROLE, GRANT ROLES, GRANT PRIVILEGES, Users Table, Roles Table, UserRoles Table, and DatabasePrivileges Table topics for more information.
AddServerEvent ModifyServerEvent DeleteServerEvent GetServerEvent GetServerEventNames	These methods are no longer necessary. ElevateDB offers jobs, which are the same thing as scheduled events in DBISAM. ElevateDB uses SQL to create and drop jobs, and a special Configuration database for storing the available jobs in a given configuration. Please see the CREATE JOB, DROP JOB, and Jobs Table topics for more information.
AddServerProcedure ModifyServerProcedure DeleteServerProcedure GetServerProcedure GetServerProcedureNames	These methods are no longer necessary. ElevateDB uses SQL to create and drop procedures, and a special Information Schema for storing the available procedures in a given database. Please see the CREATE PROCEDURE, DROP PROCEDURE, and Procedures Table topics for more information.
AddServerProcedureUser ModifyServerProcedureUser DeleteServerProcedureUser GetServerProcedureUser GetServerProcedureUserNames	These methods are no longer necessary. ElevateDB uses SQL to create and drop users and roles, and a special Configuration database for storing the available users and roles in a given configuration. ElevateDB also uses SQL for granting and revoking privileges on procedures and other objects for existing users and roles. Please see the CREATE USER, DROP USER, CREATE ROLE, DROP ROLE, GRANT ROLES, GRANT PRIVILEGES, Users Table, Roles Table, UserRoles Table, and ProcedurePrivileges Table topics for more information.
AddServerUser ModifyServerUser DeleteServerUser GetServerUser GetServerUserNames ModifyServerUserPassword	These methods are no longer necessary. ElevateDB uses SQL to create and drop users, and a special Configuration database for storing the available users in a given configuration. Please see the CREATE USER, ALTER USER, DROP USER, and Users Table topics for more information.

BuildWordList GetDefaultTextIndexParams	These methods are no longer supported. Word generation and text filtering for text indexes is directly tied to the defined text indexes in ElevateDB, so these methods are no longer possible. Please see the Text Indexing topic for more information.
ConvertIDToLocaleConstant ConvertLocaleConstantToID GetLocaleNames IsValidLocale IsValidLocaleConstant	These methods are no longer necessary. ElevateDB uses a special Configuration database for storing the available collations (locales) in a given configuration. Please see the Collations Table topic for more information.
GetServerConfig ModifyServerConfig	These methods are no longer necessary. ElevateDB stores all server startup and operational information in the TEDBEngine component itself, and all additional configuration information, such as the defined databases, users, roles, and jobs, is stored in the server configuration file. The information in the server configuration file can be accessed via the special Configuration database available for each configuration. Please see the Configuration Database topic for more information.
GetServerLogCount GetServerLogRecord	These methods are no longer necessary. ElevateDB logs all error, warning, and information events in a special binary log file available for each configuraton. The information in the log file can be accessed via the special Configuration database available for each configuration. Please see the LogEvents Table topic for more information.
GetServerMemoryUsage	This method is no longer supported, and was deprecated in the latest DBISAM versions.
GetServerSessionInfo	This method is no longer supported. Use the OnServerSessionEvent event along to track session information as sessions are created, connected, etc.
StartAdminServer StopAdminServer StartMainServer StopMainServer	These methods are no longer necessary. ElevateDB uses one port for both normal connections and administrative connections, and both types of operations can be performed using only one connection. In addition, the ElevateDB server is automatically stopped and started when the TEDBEngine Active property is assigned a new value.

Events

Removed	Description

AfterDeleteTrigger AfterInsertTrigger AfterUpdateTrigger BeforeDeleteTrigger BeforeInsertTrigger BeforeUpdateTrigger	These methods are no longer necessary. ElevateDB uses SQL to create and drop triggers, and a special Information Schema for storing the available triggers defined for the tables in a given database. Please see the CREATE TRIGGER, DROP TRIGGER, and Triggers Table topics for more information.
OnDeleteError OnInsertError OnUpdateError	These events are no longer supported.
OnCompress OnDecompress	These events are no longer supported. ElevateDB does not allow for custom compression due to the need for it to run as managed code under .NET.
OnCryptoInit OnCryptoReset OnDecryptBlock OnEncryptBlock	These events are no longer supported. ElevateDB does not allow for custom encryption due to the need for it to run as managed code under .NET.
OnCustomFunction	This event is no longer necessary. ElevateDB uses SQL to create and drop functions, and a special Information Schema for storing the available functions in a given database. Please see the CREATE FUNCTION, DROP FUNCTION, and Functions Table topics for more information.
OnServerConnect OnServerDisconnect OnServerLogin OnServerLogout OnServerReconnect	These events have been removed and replaced with the single OnServerSessionEvent event in ElevateDB. See below for more information on the new OnServerSessionEvent event.
OnServerLogCount OnServerLogEvent OnServerLogRecord	These events are no longer necessary. ElevateDB logs all error, warning, and information events in a special binary log file available for each configuraton. The information in the log file can be accessed via the special Configuration database available for each configuration. Please see the LogEvents Table topic for more information.
OnServerProcedure	This event is no longer necessary. ElevateDB uses SQL to create and drop procedures, and a special Information Schema for storing the available procedures in a given database. Please see the CREATE PROCEDURE, DROP PROCEDURE, and Procedures Table topics for more information.
OnServerScheduledEvent	This event is no longer necessary. ElevateDB offers jobs, which are the same thing as scheduled events in DBISAM. ElevateDB uses SQL to create and drop jobs, and a special Configuration database for storing the available jobs in a given configuration. Please see the CREATE JOB, DROP JOB, and Jobs Table topics for more information.
OnTextIndexFilter OnTextIndexTokenFilter	These events are no longer supported. Word generation and text filtering for text indexes is directly tied to the defined text indexes in ElevateDB, so these methods are no longer possible. Please see the Text Indexing topic for more information.

Property, Method, and Event Changes

The following are the changes to the properties, methods, and events for the component:

Properties

Changed	Description
EngineSignature	This property has been renamed to the Signature property.
LockFileName	This property has been split into two properties. In ElevateDB, the ConfigName property or CatalogName property is combined with the LockExtension property to name the lock file for either the configuration or a given database catalog.
ServerConfigFileName	This property has been split into two properties. In ElevateDB, the ConfigName property is combined with the ConfigExtension property to name the configuration file. The ConfigPath property is used to determine where the configuration file is created. ElevateDB uses a configuration file for local applications as well as the ElevateDB Server, whereas DBISAM only used a configuration file for the DBISAM Database Server.
ServerEncryptionPassword	This property has been renamed to the EncryptionPassword property. ElevateDB uses the EncryptionPassword property for all encryption in the application.
ServerLicensedConnections	This property has been renamed to the LicensedSessions property. ElevateDB supports session count restrictions based upon the LicensedSessions property for both local applications and the ElevateDB server.
ServerMainAddress ServerMainPort ServerMainThreadCacheSize	These properties have been renamed with the "Main" portion stripped out. ElevateDB uses one port for both normal connections and administrative connections, and both types of operations can be performed using only one connection.
TableDataExtension TableIndexExtension TableBlobExtension	These proeprties have renamed to the TableExtension property, the TableIndexExtension property, and the TableBlobExtension property, respectively.

Methods

Changed	Description

AnsiStrToBoolean AnsiStrToCurr AnsiStrToDate AnsiStrToDateTime AnsiStrToFloat AnsiStrToTime BooleanToAnsiStr CurrToAnsiStr DateToAnsiStr DateTimeToAnsiStr FloatToAnsiStr TimeToAnsiStr	These methods have been renamed with the "Ansi" portion replaced with "SQL". This was done to reflect that these methods now work with both ANSI strings and Unicode (wide) strings.

Events

Changed	Description
OnServerStart OnServerStop OnShutdown OnStartup	These events have been replaced with the BeforeStart, AfterStart, BeforeStop, and AfterStop events. Also, the new events apply regardless of whether the engine component is configured to run as a client engine or a server engine via the EngineType property.

New Properties, Methods, and Events

The following are the new properties, methods, and events added in the new ElevateDB component:

Properties

New	Description
BackupExtension	This property is used to specify the extension used for ElevateDB backup files. Please see the BACKUP DATABASE, RESTORE DATABASE, and Backups Table topics for more information.
UpdateExtension	This property is used to specify the extension used for ElevateDB update files. Please see the SAVE UPDATES, LOAD UPDATES, and Updates Table topics for more information.
TablePublishExtension	This property is used to specify the extension used for the publish files associated with published ElevateDB tables. Please see the PUBLISH DATABASE, UNPUBLISH DATABASE, and Tables Table topics for more information.
CatalogName CatalogExtension	These two properties are combined together to specify the file name used by ElevateDB for all database catalogs.
LogExtension LogCategories MaxLogFileSize	These properties are used in ElevateDB to control the naming of the log file, what types of events are logged in the log file, and the maximum log file size. ElevateDB combines the ConfigName property with the LogExtension property to name the log file, and the log file is always created in the path specified by the ConfigPath property. The log file in ElevateDB is a ciruclar log file, and the MaximumLogFileSize determines at which file size ElevateDB starts to re-use the log file space

	of the oldest log entries with the newer log entries.
ServerAuthorizedAddresses ServerBlockedAddresses ServerDeadSessionExpiration ServerDeadSessionInterval ServerMaxDeadSessions ServerSessionTimeout	These properties were added to replace the same server configuration file settings that were available in the DBISAM Database Server.
ServerRunJobs ServerJobCategory	These properties determine whether the ElevateDB Server can run jobs, and if so, what category of jobs it should run.
TempTablesPath	This property specifies where any temporary tables created by the engine will be stored.

Methods

New	Description
GetTempTablesPath	This method returns the operating system-defined temporary files path.
DayTimeIntervalToSQLStr YearMonthIntervalToSQLStr SQLStrToDayTimeInterval SQLStrToYearMonthInterval	These four methods are used to convert SQL intervals, either day-time intervals or year-month intervals, to and from strings. Please see the Interval Types topic for more information.

Events

New	Description
None	

3.8 TDBISAMSession Component

Removed Properties, Methods and Events

The following are the properties, methods, and events that have been removed for the component:

Properties

Removed	Description
CurrentServerUser	This property is no longer necessary. ElevateDB uses SQL for procedures and functions.
PrivateDir	This property is no longer necessary. ElevateDB uses one temporary tables property setting, the TempTablesPath property, for all sessions.
RemoteEncryptionPassword	This property is no longer necessary. ElevateDB uses one encryption password per application for all encryption, and it is represented by the EncryptionPassword property.
RemoteParams	This property is no longer necessary. ElevateDB uses SQL for procedures and the TEDBStoredProc component for executing the procedures.
StrictChangeDetection	This property is no longer supported. ElevateDB does not support strict change detection.

Methods

Removed	Description
AddPassword GetPassword RemoveAllPasswords RemotePassword	These methods are no longer supported. ElevateDB offers a complete user security architecture that surpasses simple password access to individual tables. Please see the User Security topic for more information.
AddRemoteDatabase ModifyRemoteDatabase DeleteRemoteDatabase GetRemoteDatabase GetRemoteDatabaseNames	These methods are no longer necessary. ElevateDB uses SQL to create and drop databases, and a special Configuration database for storing the available databases in a given configuration. Please see the CREATE DATABASE, DROP DATABASE, and Databases Table topics for more information.
AddRemoteDatabaseUser ModifyRemoteDatabaseUser DeleteRemoteDatabaseUser GetRemoteDatabaseUser GetRemoteDatabaseUserNames	These methods are no longer necessary. ElevateDB uses SQL to create and drop users and roles, and a special Configuration database for storing the available users and roles in a given configuration. ElevateDB also uses SQL for granting and revoking privileges on databases and other objects for existing users and roles. Please see the CREATE USER, DROP USER, CREATE ROLE, DROP ROLE, GRANT ROLES, GRANT PRIVILEGES, Users Table, Roles Table, UserRoles Table, and DatabasePrivileges Table topics for more information.
AddRemoteEvent ModifyRemoteEvent	These methods are no longer necessary. ElevateDB offers jobs, which are the same thing as scheduled events in

DeleteRemoteEvent GetRemoteEvent GetRemoteEventNames	DBISAM. ElevateDB uses SQL to create and drop jobs, and a special Configuration database for storing the available jobs in a given configuration. Please see the CREATE JOB, DROP JOB, and Jobs Table topics for more information.
AddRemoteProcedure ModifyRemoteProcedure DeleteRemoteProcedure GetRemoteProcedure GetRemoteProcedureNames	These methods are no longer necessary. ElevateDB uses SQL to create and drop procedures, and a special Information Schema for storing the available functions in a given database. Please see the CREATE PROCEDURE, DROP PROCEDURE, and Procedures Table topics for more information.
AddRemoteProcedureUser ModifyRemoteProcedureUser DeleteRemoteProcedureUser GetRemoteProcedureUser GetRemoteProcedureUserNames	These methods are no longer necessary. ElevateDB uses SQL to create and drop users and roles, and a special Configuration database for storing the available users and roles in a given configuration. ElevateDB also uses SQL for granting and revoking privileges on procedures and other objects for existing users and roles. Please see the CREATE USER, DROP USER, CREATE ROLE, DROP ROLE, GRANT ROLES, GRANT PRIVILEGES, Users Table, Roles Table, UserRoles Table, and ProcedurePrivileges Table topics for more information.
AddRemoteUser ModifyRemoteUser ModifyRemoteUserPassword DeleteRemoteUser GetRemoteUser GetRemoteUserNames ModifyRemoteUserPassword	These methods are no longer necessary. ElevateDB uses SQL to create and drop users, and a special Configuration database for storing the available users in a given configuration. Please see the CREATE USER, ALTER USER, DROP USER, and Users Table topics for more information.
CallRemoteProcedure RemoteParamByName SendProcedureProgress	These methods are no longer necessary. ElevateDB uses SQL for procedures and the TEDBStoredProc component for executing the procedures.
DisconnectRemoteSession RemoveRemoteSession	These methods are no longer necessary. ElevateDB uses the DISCONNECT SERVER SESSION and REMOVE SERVER SESSION statements to disconnect and remove server sessions on an ElevateDB Server. You can issue these statements via the new Execute method.
GetRemoteAdminAddress GetRemoteAdminPort GetRemoteAdminThreadCacheSize GetMainAdminAddress GetMainAdminPort GetMainAdminThreadCacheSize	These methods are no longer necessary. ElevateDB uses one port for both normal connections and administrative connections, and both types of operations can be performed using only one connection. In addition, the address, port, and thread cache size parameters for an ElevateDB server are not configurable remotely and must be configured prior to starting an ElevateDB server.
GetRemoteConfig ModifyRemoteConfig	These methods are no longer necessary. ElevateDB stores all server startup and operational information in the TEDBEngine component itself, and all additional configuration information, such as the defined databases, users, roles, and jobs, is stored in the server configuration file. The information in the server configuration file can be accessed via the special Configuration database available for each configuration. Please see the Configuration Database topic for more information.

GetRemoteConnectedSessionCount GetRemoteSessionCount GetRemoteSessionInfo	These methods are no longer necessary. ElevateDB uses SQL to query any ElevateDB server sessions, and a special Configuration database for storing the server sessions on a given ElevateDB server. Please see the ServerSessions Table topic for more information.
GetRemoteLogCount GetRemoteLogRecord	These methods are no longer necessary. ElevateDB logs all error, warning, and information events in a special binary log file available for each configuraton. The information in the log file can be accessed via the special Configuration database available for each configuration. Please see the LogEvents Table topic for more information.
GetRemoteMemoryUsage	This method is no longer supported, and was deprecated in the latest DBISAM versions.
GetRemoteUpTime	This method is no longer supported.
RemoveAllRemoteMemoryTables	This method is no longer supported.
StartRemoteServer StopRemoteServer	These methods are no longer supported. The ElevateDB server cannot be remotely stopped and started.

Events

Removed	Description
OnPassword	This event is no longer supported. ElevateDB offers a complete user security architecture that surpasses simple password access to individual tables. Please see the User Security topic for more information.

Property, Method, and Event Changes

The following are the changes to the properties, methods, and events for the component:

Properties

Changed	Description

Active	This property has been renamed to the Connected property.
CurrentRemoteUser	This property has been renamed to the CurrentUser property. ElevateDB requires a user login for both local and remote sessions.
LockProtocol LockRetryCount LockWaitTime	These properties have been renamed and prefixed with "Record" in ElevateDB in order to make clear that these properties deal with row locking exclusively.
ProgressSteps	This property has been changed to the ProgressTimeInterval property, which uses a time interval instead of a fixed number of progress steps to ensure that progress updates still take place in a reasonable span of time irrespective of the length or scope of a given operation.
RemoteUser RemotePassword	These properties have been renamed to the LoginUser and LoginPassword properties, respectively. ElevateDB requires a user login for both local and remote sessions.

Methods

Changed	Description
GetRemoteEngineVersion	This method has been renamed to the GetRemoteServerVersion method.

Events

Changed	Description
OnRemoteLogin	This event has been renamed to the OnLogin event. ElevateDB requires a user login for both local and remote sessions.
OnRemoteTrace	This event uses a different record type for the trace record that is passed as a parameter to the event handler.
OnShutdown OnStartup	These events have been replaced with the BeforeConnect, AfterConnect, BeforeDisconnect, and AfterDisconnect events. Also, the new events apply regardless of whether the session component is configured to run as a remote session or a local session via the SessionType property.

New Properties, Methods, and Events

The following are the new properties, methods, and events added in the new ElevateDB component:

Properties

New	Description

KeepTablesOpen	This property has been moved from the database level to the session level in ElevateDB. This gives the developer the ability to control whether tables should be kept open even in SQL procedures or functions in addition to controlling whether tables should be kept open during normal table and query processing.
RecordChangeDetection	This property was added to allow the developer to specify whether changes to a row will issue a warning exception when the row is updated or deleted. In DBISAM this behavior was not configurable and any changes to a row would cause an #8708 (DBISAM_KEYORRECDELETED) exception to be raised.
SessionDescription	This property allows the developer to specify a description for the session.
SQLStmtCacheSize	This property allows the developer to specify an SQL statement cache size all open databases in the session.
FuncProcCacheSize	This property allows the developer to specify a function/procedure cache size all open databases in the session.
ExcludeFromLicensedSessions	This property specifies whether the current session should be included in the session license count controlled by the TEDBEngine LicensedSessions property for local sessions, or by the ElevateDB Server for remote sessions.

Methods

New	Description
CalculateCRC32ForStream	This method calculates a CRC32 checksum for a stream.
Execute	This method allows you to execute an SQL statement against the special Configuration database. This is useful for performing configuration-level queries or operations.
GetStoredProcNames	This method populates a list with the names of all stored procedures and functions defined within the specified database.
SaveStoreFileToStream	This method loads a store file into a stream.
SaveStreamToStoreFile	This method saves a stream to a store file.
FreeCachedSQLStmts	This method allows you to free all cached SQL statements for a specific open database, or for all open databases.
FreeCachedFuncProcs	This method allows you to free all cached functions/procedures for a specific open database, or for all open databases.

Events

New	Description
None	

3.9 TDBISAMDatabase Component

Removed Properties, Methods and Events

The following are the properties, methods, and events that have been removed for the component:

Properties

Removed	Description
KeepTablesOpen	This property has been moved to the session level and the TEDBSession component.

Methods

Removed	Description
Backup BackupInfo Restore	These methods are no longer necessary. ElevateDB uses SQL for backing up and restoring databases, as well as retrieving information about backups from disk, and a special Configuration database for storing the available backups in a given configuration. Please see the BACKUP DATABASE, RESTORE DATABASE, SET BACKUPS STORE, and Backups Table topics for more information.

Events

Removed	Description
None	

Property, Method, and Event Changes

The following are the changes to the properties, methods, and events for the component:

Properties

Changed	Description
Directory RemoteDatabase	These properties have been replaced by the single Database property. ElevateDB uses SQL to create and drop databases, and a special Configuration database for storing the available databases in a given configuration. Please see the CREATE DATABASE, DROP DATABASE, and Databases Table topics for more information.

Methods

Changed	Description

StartTransaction	The StartTransaction method accepts a list of tables as a string array instead of a TStrings object, and there is one additional parameter for specifying the transaction lock timeout in milliseconds.

Events

Changed	Description
OnBackupLog OnBackupProgress OnRestoreLog OnRestoreProgress	These events have been replaced with the OnLogMessage, OnProgress, and OnStatusMessage events.

New Properties, Methods, and Events

The following are the new properties, methods, and events added in the new ElevateDB component:

Properties

New	Description
None	

Methods

New	Description
TableInTransaction	The TableInTransaction method is used to determine if a specific table is involved in the current transaction.

Events

New	Description
None	

3.10 TDBISAMDataSet Component

Removed Properties, Methods and Events

The following are the properties, methods, and events that have been removed for the component:

Properties

Removed	Description
AutoDisplayLabels	This property is no longer supported.
FilterOptimizeLevel	This property is no longer supported. Eventually it will be replaced by a FilterPlan property instead.
FilterRecordCount	This property is no longer necessary. ElevateDB does not provide logical record numbers (sequence numbers).
KeySize	This property has been moved to the TEDBTable component.
RecordHash RecordID	These properties are no longer necessary. ElevateDB does not use record hashes or IDs.

Methods

Removed	Description
ExportTable ImportTable	These methods are no longer necessary. ElevateDB uses SQL for importing and exporting tables to and from delimited text. Please see the EXPORT TABLE and IMPORT TABLE topics for more information.

Events

Removed	Description
OnCachedUpdateError	This event is not used anymore because ElevateDB uses ERROR triggers for handling update errors. Please see the CREATE TRIGGER topic in the ElevateDB SQL Manual for more information.
OnLoadFromStreamProgress OnSaveToStreamProgress	These events are no longer supported. ElevateDB streams should be kept fairly small since they are stored in memory. Any stream that is large enough to require progress updates is probably too large and should be handled differently.

Property, Method, and Event Changes

The following are the changes to the properties, methods, and events for the component:

Properties

Changed	Description

RecNo	This property no longer returns a logical record number as it did in DBISAM. It returns zero (0) at all times under ElevateDB. However, you can still assign a value to the property in order to navigate to a specific logical row in the dataset.

Methods

Changed	Description
IsSequenced	This method always returns False under ElevateDB. ElevateDB does not provide logical record numbers (sequence numbers).
LoadFromStream SaveToStream	ElevateDB uses a completely different stream format than DBISAM. Do not attempt to load a stream created by DBISAM into ElevateDB, or vice-versa.

Events

Changed	Description
None	

New Properties, Methods, and Events

The following are the new properties, methods, and events added in the new ElevateDB component:

Properties

New	Description
None	

Methods

New	Description
LockCurrentRecord UnlockCurrentRecord UnlockAllRecords	These methods allow you to manually lock and unlock rows in the current cursor.

Events

New	Description
None	

3.11 TDBISAMDBDataSet Component

Removed Properties, Methods and Events

The following are the properties, methods, and events that have been removed for the component:

Properties

Removed	Description
None	

Methods

Removed	Description
None	

Events

Removed	Description
None	

Property, Method, and Event Changes

The following are the changes to the properties, methods, and events for the component:

Properties

Changed	Description
None	

Methods

Changed	Description
None	

Events

Changed	Description
None	

New Properties, Methods, and Events

The following are the new properties, methods, and events added in the new ElevateDB component:

Properties

New	Description
None	

Methods

New	Description
None	

Events

New	Description
None	

3.12 TDBISAMTable Component

Removed Properties, Methods and Events

The following are the properties, methods, and events that have been removed for the component:

Properties

Removed	Description
LocaleID Description Encrypted Password IndexPageSize BlobBlockSize LastAutoIncValue TextIndexFields TextIndexIncludeChars TextIndexSpaceChars TextIndexStopWords UserMajorVersion UserMinorVersion	These properties are no longer necessary. ElevateDB maintains all database metadata in the special Information Schema for each database. The Information schema tables can be queried like any normal tables for information on the structure of tables, columns, indexes, etc.
Exists	This property is no longer necessary. To determine if a table or view exists in a database, query the special Information Schema for the database.
FullTableName LastUpdated TableSize	These properties are no longer supported. The TEDBTable component supports opening both tables and views. Therefore, returning the physical characteristics of a table is not feasible in all cases.
VersionNum	This property is no longer necessary.

Methods

Removed	Description

CreateTable AlterTable CopyTable RenameTable DeleteTable AddIndex DeleteIndex DeleteAllIndexes	These methods are no longer necessary. ElevateDB uses SQL for all table and index creation, alteration, or drops. Please see the CREATE TABLE, ALTER TABLE, DROP TABLE, CREATE INDEX, CREATE TEXT INDEX, and DROP INDEX topics for more information.
LockSemaphore UnlockSemaphore	These methods are no longer supported. ElevateDB does not support semaphore locks.
LockTable UnlockTable TableIsLocked	These methods are no longer supported. ElevateDB does not support table locks. Instead, it supports manual row locking via the LockCurrentRecord, UnlockCurrentRecord, and UnlockAllRecords methods.
OptimizeTable RepairTable VerifyTable UpgradeTable	These methods are no longer necessary. ElevateDB uses SQL for all administrative functionality. Please see the OPTIMIZE TABLE and REPAIR TABLE topics for more information.

Events

Removed	Description
OnAlterProgress OnDataLost OnCopyProgress OnIndexProgress	These events are no longer necessary. ElevateDB uses SQL for all table and index creation, alteration, or drops, and the OnLogMessage, OnProgress, and OnStatusMessage events provide the same functionality.
OnExportProgress OnImportProgress	These events are no longer necessary. ElevateDB uses SQL for importing and exporting tables, and the OnLogMessage, OnProgress, and OnStatusMessage events provide the same functionality.
OnOptimizeProgress OnRepairProgress OnRepairLog OnVerifyProgress OnVerifyLog OnUpgradeProgress OnUpgradeLog	These events are no longer necessary. ElevateDB uses SQL for all administrative functionality, and the OnLogMessage, OnProgress, and OnStatusMessage events provide the same functionality.

Property, Method, and Event Changes

The following are the changes to the properties, methods, and events for the component:

Properties

Changed	Description

FieldDefs	This property no longer uses a custom TDBISAMFieldDefs type for the field definitions collection. In ElevateDB this property uses the standard TFieldDefs collection type.
IndexDefs	This property no longer uses a custom TDBISAMIndexDefs type for the index definitions collection. In ElevateDB this property uses the standard TIndexDefs collection type.
TableName	This property now accepts a view name in addition to a table name. Furthermore, the drop-down combo box for this property in the Object Inspector will contain all tables and views defined for the database.

Methods

Changed	Description
None	

Events

Changed	Description
None	

New Properties, Methods, and Events

The following are the new properties, methods, and events added in the new ElevateDB component:

Properties

New	Description
None	

Methods

New	Description
None	

Events

New	Description
None	

3.13 TDBISAMQuery Component

Removed Properties, Methods and Events

The following are the properties, methods, and events that have been removed for the component:

Properties

Removed	Description
TableName	This property is no longer supported.

Methods

Removed	Description
SaveToTable	This method is no longer supported. In ElevateDB, use the AS clause of the CREATE TABLE to create a table that is based upon a query expression.

Events

Removed	Description
BeforeExecute AfterExecute OnGetParams OnQueryError	These events are no longer supported. ElevateDB does not support multi-statement scripts in the TEDBQuery component.
OnAlterProgress OnDataLost OnCopyProgress	These events are no longer necessary. ElevateDB uses SQL for all table and index creation, alteration, or drops, and the OnLogMessage, OnProgress, and OnStatusMessage events provide the same functionality.
OnExportProgress OnImportProgress	These events are no longer necessary. ElevateDB uses SQL for importing and exporting tables, and the OnLogMessage, OnProgress, and OnStatusMessage events provide the same functionality.
OnOptimizeProgress OnRepairProgress OnRepairLog OnVerifyProgress OnVerifyLog OnUpgradeProgress OnUpgradeLog	These events are no longer necessary. ElevateDB uses SQL for all administrative functionality, and the OnLogMessage, OnProgress, and OnStatusMessage events provide the same functionality.
OnQueryProgress	This event is no longer necessary. The OnProgress event provides the same functionality.
OnSaveProgress	This event is no longer supported since the SaveToTable method is no longer supported. In ElevateDB, use the AS clause of the CREATE TABLE to create a table that is based upon a query expression.

Property, Method, and Event Changes

The following are the changes to the properties, methods, and events for the component:

Properties

Changed	Description
GeneratePlan	This property has been renamed to the RequestPlan property.
Params	This property no longer uses a custom TDBISAMParams type for the parameter definitions collection. In ElevateDB this property uses the standard TParams collection type.
RequestLive	This property has been renamed to the RequestSensitive property.
ResultIsLive	This property has been renamed to the Sensitive property.
SQL	This property only accepts a single SQL statement in ElevateDB. DBISAM allow for multi-statement scripts.
SQLStatementType	This property has been renamed to the StatementType property.
StmtHandle	This property has been renamed to the StatementHandle property.

Methods

Changed	Description
None	

Events

Changed	Description
None	

New Properties, Methods, and Events

The following are the new properties, methods, and events added in the new ElevateDB component:

Properties

New	Description
Constrained	This property allows you to specify that any inserts or updates made to a sensitive result set be subject to the WHERE clause used in the current SELECT statement.

Methods

New	Description

None	

Events

New	Description
None	

3.14 TDBISAMUpdateSQL Component

Removed Properties, Methods and Events

The following are the properties, methods, and events that have been removed for the component:

Properties

Removed	Description
None	

Methods

Removed	Description
None	

Events

Removed	Description
None	

Property, Method, and Event Changes

The following are the changes to the properties, methods, and events for the component:

Properties

Changed	Description
None	

Methods

Changed	Description
None	

Events

Changed	Description
None	

New Properties, Methods, and Events

The following are the new properties, methods, and events added in the new ElevateDB component:

Properties

New	Description
None	

Methods

New	Description
None	

Events

New	Description
None	

3.15 EDBISAMEngineError Object

Removed Properties, Methods and Events

The following are the properties, methods, and events that have been removed for the component:

Properties

Removed	Description
ErrorDatabaseName ErrorEventName ErrorFieldName ErrorIndexName ErrorProcedureName ErrorRemoteName ErrorTableName ErrorUserName OSErrorCode SocketErrorCode	These properties are no longer necessary. ElevateDB provides logging facilities that negates the need for custom logging of the properties of an exception.

Methods

Removed	Description
None	

Events

Removed	Description
None	

Property, Method, and Event Changes

The following are the changes to the properties, methods, and events for the component:

Properties

Changed	Description
ErrorMessage	This property has been renamed to the ErrorMsg property.

Methods

Changed	Description
None	

Events

Changed	Description
None	

New Properties, Methods, and Events

The following are the new properties, methods, and events added in the new ElevateDB component:

Properties

New	Description
None	

Methods

New	Description
None	

Events

New	Description
None	

3.16 SQL Changes

The following is the list of the areas that describe the DBISAM SQL implementation. Click on each area to find out the changes to the SQL implementation.

Naming Conventions
Types
Operators
Functions
Statements

3.17 Naming Conventions

Removed Features

The following are the features that have been removed:

Removed	Description
Brackets []	The use of brackets [] for identifiers is no longer supported. Use double-quotes "" instead to specify an identifier in an SQL statement.

Feature Changes

The following are the changes to the features:

Changed	Description
Path Names	Path names are no longer supported for databases in ElevateDB. Use the database name with a period separator in order to specify a table from a specific database. Please see the Identifiers topic for more information.

New Features

The following are the new features:

New	Description
Line Feeds in String Constants	ElevateDB allows for carriage returns (character 13) and line feeds (character 10) in string constants.

3.18 Types

Removed Types

The following are the types that have been removed:

Removed	Description
AUTOINC	This type is no longer supported. Use the INTEGER type instead to store integer values, and use the GENERATED clause in a column definition to dictate that a column should be generated as an IDENTITY column. Please see the CREATE TABLE topic for more information.
MONEY	This type is no longer supported. Use the FLOAT type instead to store double-precision floating-point values. Please see the Approximate Numeric Types topic for more information.
GRAPHIC	This type is no longer supported. Use the BLOB type instead to store graphics or any other large binary objects. Please see the Binary Types topic for more information.
WORD	This type is no longer supported. Use the INTEGER type instead to store word values. Please see the Exact Numeric Types topic for more information.

Type Changes

The following are the changes to the types:

Changed	Description
CHAR	The CHAR (or CHARACTER) type now uses a fixed-length representation according to the SQL standard. Any strings that are shorter than the defined length of the column are padded with blanks.
VARCHAR	The alternate CHARACTER VARYING syntax is now acceptable. Also, VARCHAR columns no longer right-trim any spaces from strings that are stored in them. The string values are stored as-is.
BYTES or BINARY VARBYTES or VARBINARY	These types have been renamed to BYTE and VARBYTE (or BYTE VARYING), respectively.
LONGVARBINARY	This type has been renamed to BINARY LARGE OBJECT. The shorthand BLOB type notation is still retained also.
MEMO LONGVARCHAR	These types have been renamed to CLOB and CHARACTER LARGE OBJECT, respectively.
BIT	This shorthand notation for the BOOLEAN type is no longer permitted.
LARGEINT	This type has been renamed to BIGINT.
FLOAT	The alternate DOUBLE PRECISION syntax is now acceptable.

DATE TIME TIMESTAMP	Date, time, and timestamp literals must now be preceded with the DATE, TIME, and TIMESTAMP keywords, respectively.

New Types

The following are the new types:

New	Description
INTERVAL	ElevateDB now supports all day-time and year-month interval types. Please see the Interval Types topic for more information.

3.19 Operators

Removed Operators

The following are the operators that have been removed:

Removed	Description
None	

Operator Changes

The following are the changes to the operators:

Changed	Description
NULL Values	NULL constants can no longer be compared using the =, <>, >=, <=, >, <, BETWEEN, or IN operators. You must use the IS NULL and IS NOT NULL operators instead. Furthermore, none of the operators will result in a TRUE value if either side of the operator contains a NULL value. Please see the NULLs topic for more information.
Case-Insensitive Comparisons	DBISAM supported using the UPPER() or LOWER() function around a column reference and a string constant involved in a binary operator in order to force a case-insensitive comparison, and to allow the query optimizer to use a case-insensitive index to optimize the operation. This is no longer necessary in ElevateDB. Instead, you can simply use the COLLATE clause after the column reference to force the column to use a case-insensitive collation. Please see the Internationalization and Optimizer topics for more information.
Date, Time, and Timestamp Values	Subracting date, time, and timestamp values now results in an interval type, depending upon the type of the values being subtracted. Please see the Interval Types topic for more information.

New Operators

The following are the new operators:

New	Description
CONTAINS DOES NOT CONTAIN	These operators are used to implement a text search using a text index. If no text index exists on the column being searched, then these operators will always result in a FALSE value.

3.20 Functions

Removed Functions

The following are the functions that have been removed:

Removed	Description
MOD	This function is no longer necessary. You may use the MOD operator instead with ElevateDB.
LASTAUTOINC IDENT_CURRENT	These functions are no longer necessary. ElevateDB procedures and functions can retrieve the assigned IDENTITY value for a column using the FETCH statement on a cursor.
TEXTOCCURS	This function is no longer supported.
YEARSFROMMSECS DAYSFROMMSECS HOURSFROMMSECS MINSFROMMSECS SECSFROMMSECS MSECSFROMMSECS	These functions are no longer necessary. ElevateDB supports the standard SQL date and time interval types. Please see the Interval Types topic for more information.

Function Changes

The following are the changes to the functions:

Changed	Description
SUBSTRING	The alternate SUBSTR syntax is now acceptable.
TEXTSEARCH	This function has been changed to the CONTAINS and DOES NOT CONTAIN operators.

New Functions

The following are the new functions:

New	Description
None	

3.21 Statements

Removed Statements

The following are the statements that have been removed:

Removed	Description
EMPTY TABLE	This statement is no longer supported. ElevateDB requires that you use the DELETE statement to remove all rows from a table.
VERIFY TABLE	This statement is no longer supported. ElevateDB currently only offers repair facilities by using the REPAIR TABLE statement.
UPGRADE TABLE	This statement is no longer necessary.
START TRANSACTION COMMIT ROLLBACK	These statements are now considered part of the ElevateDB SQL/PSM support and are only allowed in jobs, procedures, functions, and triggers. Outside of SQL/PSM, use the TEDBDatabase StartTransaction, Commit, and Rollback

Statement Changes

The following are the changes to the statements:

Changed	Description
SELECT	ElevateDB supports single-row query expressions as values in the list of selected columns. The INTO clause is no longer supported. ElevateDB uses the standard SQL CREATE TABLE AS clause to create a table using a query expression. The EXCLUSIVE clause is no longer necessary. With ElevateDB you can use the actual table name or the table correlation name in column references anywhere in the SELECT statement. ElevateDB supports single-row query expressions as values in the JOIN clauses. ElevateDB does not optimize join expressions in the WHERE clause, otherwise known as SQL-89 style joins. You must use the JOIN clause in order to have ElevateDB optimize the joins. ElevateDB supports correlated sub-queries in the WHERE clause. ElevateDB supports single-row query expressions as values in the WHERE clause.

	The GROUP BY, HAVING, and ORDER BY clauses in ElevateDB support any type of expression, and may refer to columns that aren't in the SELECT list. The GROUP BY and ORDER BY clauses no longer support ordinal values as a way to specify a SELECT column position in the list of SELECT column expressions. You must specify the actual column reference or expression. The NOCASE clause is no longer necessary in the ORDER BY clause. ElevateDB uses the COLLATE clause to specify the collation for an ORDER BY expression. Please see the Internationalization topic for more information. The TOP clause is no longer supported. ElevateDB will introduce standard WINDOW clause support for selecting ranges of rows in a later release. The LOCALE clause is no longer necessary. ElevateDB supports column-level collations. Please see the Internationalization topic for more information. The ENCRYPTED WITH clause is no longer supported.
INSERT	The EXCLUSIVE clause is no longer necessary. The COMMIT clause is no longer supported. ElevateDB internally determines the optimal commit interval for lengthy INSERT statements.
UPDATE	The EXCLUSIVE clause is no longer necessary. The FROM clause is no longer supported. ElevateDB can use correlated sub-queries in the UPDATE values and/or WHERE clause. The COMMIT clause is no longer supported. ElevateDB internally determines the optimal commit interval for lengthy UPDATE statements. The NOJOINOPTIMIZE clause is no longer supported. The JOINOPTIMIZECOSTS clause is no longer supported.
DELETE	The EXCLUSIVE clause is no longer necessary. The FROM clause is no longer supported. ElevateDB can use correlated sub-queries in the WHERE clause. The COMMIT clause is no longer supported. ElevateDB internally determines the optimal commit interval for lengthy DELETE statements. The NOJOINOPTIMIZE clause is no longer supported. The JOINOPTIMIZECOSTS clause is no longer supported.

CREATE TABLE	The IF NOT EXISTS clause is no longer supported. ElevateDB uses catalog queries to determine if a table exists. Please see the System Information topic for more information. The column definition NULLABLE clause is no longer supported. To make a column nullable in ElevateDB, don't include the NOT NULL clause. The column definition DEFAULT clause accepts any basic expression in ElevateDB. A column definition may now include a GENERATED clause to specify that the column is a generated column. Generated columns can be generated as sequence numbers or expressions. The column definition MIN and MAX clauses are no longer necessary. ElevateDB supports column constraints via the CHECK clause. ElevateDB allows for specifying primary key, unique key, and foreign key constraints in a column definition. The CHARCASE clause is no longer supported. The COMPRESS clause has been renamed to COMPRESSION and moved so that it is next to the data type definition. The NOCASE clause is no longer necessary in a primary key, unique key, or foreign key (new) constraint definition. ElevateDB uses the collation defined for the column in the column definition for determining the collation of these types of constraints. Please see the Internationalization topic for more information. The DESC and ASC clauses are no longer supported in a primary key, unique key, or foreign key (new) constraint definition. Use the CREATE INDEX statement in ElevateDB to create an index with custom column sorting. The COMPRESS clause is no longer supported in a primary key, unique key, or foreign key (new) constraint definition. ElevateDB performs automatic index compression as necessary. The TEXT INDEX, STOP WORDS, SPACE CHARS, and INCLUDE CHARS clauses are no longer necessary. Use the CREATE TEXT INDEX statement in ElevateDB to create a new text index. The LOCALE clause is no longer necessary. ElevateDB supports column-level collations. Please see the Internationalization topic for more information. The WITH clause of the ENCRYPTED clause is no longer necessary. ElevateDB uses one encryption password per

	application for all encryption, and it is represented by the EncryptionPassword property. Also, the ENCRYPTED clause now resides after the VERSION clause (see next item). The USER MAJOR VERSION and USER MINOR VERSION clauses have been combined into one VERSION clause that accepts a NUMERIC value with a scale of 2. Also, the VERSION clause now resides after the DESCRIPTION clause. The LAST AUTOINC clause is no longer necessary. The seed and increment values for IDENTITY columns can be specified in the column definitions.
CREATE INDEX	The IF NOT EXISTS clause is no longer supported. ElevateDB uses catalog queries to determine if an index exists. Please see the System Information topic for more information. The UNIQUE clause is no longer supported. ElevateDB requires that unique keys constraints be defined using a constraint definition in a CREATE TABLE or ALTER TABLE statement. The NOCASE clause is no longer necessary in an index definition. ElevateDB uses the collation defined for the column in the column definition for determining the default collation for the indexed columns, and also allows for the COLLATE clause to be used in the index definition in order to override the default column collation. Please see the Internationalization topic for more information. The COMPRESS clause is no longer supported in an index definition. ElevateDB performs automatic index compression as necessary.
ALTER TABLE	The IF EXISTS clause is no longer supported. ElevateDB uses catalog queries to determine if a table exists. Please see the System Information topic for more information. The IF EXISTS and IF NOT EXISTS clauses are no longer supported for column definitions. ElevateDB uses catalog queries to determine if a table column exists. Please see the System Information topic for more information. The REDEFINE clause is no longer supported for column definitions. In order to redefine a column using the same column name, use the ALTER AS clause (see next). In order to rename a column, use the RENAME clause. The ALTER clause is new for column definitions. This clause allows you to alter the DEFAULT expression, drop the default expression, change the DESCRIPTION of the column, move the column to a new position in the table using the MOVE TO clause, or alter the entire column definition using the AS clause. The column definition AT clause has been moved to the end of the column definition.

	The column definition NULLABLE clause is no longer supported. To make a column nullable in ElevateDB, don't include the NOT NULL clause. The column definition DEFAULT clause accepts any basic expression in ElevateDB. A column definition may now include a GENERATED clause to specify that the column is a generated column. Generated columns can be generated as sequence numbers or expressions. The column definition MIN and MAX clauses are no longer necessary. ElevateDB supports column constraints via the CHECK clause. ElevateDB allows for specifying primary key, unique key, and foreign key constraints in a column definition. The CHARCASE clause is no longer supported. The COMPRESS clause has been renamed to COMPRESSION and moved so that it is next to the data type definition. The REDEFINE clause is no longer supported for constraint definitions. Use the RENAME clause to rename a constraint. The NOCASE clause is no longer necessary in a primary key, unique key, or foreign key (new) constraint definition. ElevateDB uses the collation defined for the column in the column definition for determining the collation of these types of constraints. Please see the Internationalization topic for more information. The DESC and ASC clauses are no longer supported in a primary key, unique key, or foreign key (new) constraint definition. Use the CREATE INDEX statement in ElevateDB to create an index with custom column sorting. The COMPRESS clause is no longer supported in a primary key, unique key, or foreign key (new) constraint definition. ElevateDB performs automatic index compression as necessary. The TEXT INDEX, STOP WORDS, SPACE CHARS, and INCLUDE CHARS clauses are no longer necessary. Use the CREATE TEXT INDEX statement in ElevateDB to create a new text index. The LOCALE clause is no longer necessary. ElevateDB supports column-level collations. Please see the Internationalization topic for more information. The WITH clause of the ENCRYPTED clause is no longer necessary. ElevateDB uses one encryption password per

	application for all encryption, and it is represented by the EncryptionPassword property. Also, the ENCRYPTED clause now resides after the VERSION clause (see next item). The USER MAJOR VERSION and USER MINOR VERSION clauses have been combined into one VERSION clause that accepts a NUMERIC value with a scale of 2. Also, the VERSION clause now resides after the DESCRIPTION clause. The LAST AUTOINC clause is no longer necessary. The seed and increment values for IDENTITY columns can be specified in the column definitions. The NOBACKUP clause has been renamed to the NO BACKUP FILES clause.
DROP TABLE	The IF EXISTS clause is no longer supported. ElevateDB uses catalog queries to determine if a table exists. Please see the System Information topic for more information.
DROP INDEX	The IF EXISTS clause is no longer supported. ElevateDB uses catalog queries to determine if an index exists. Please see the System Information topic for more information. The PRIMARY clause is no longer supported. ElevateDB does not allow a primary key to be dropped using the DROP INDEX statement. Instead, you must use the ALTER TABLE statement to add or drop constraints for a table.
IMPORT TABLE	The IF EXISTS clause is no longer supported. ElevateDB uses catalog queries to determine if a table exists. Please see the System Information topic for more information. The COLUMNS clause has been renamed and the COLUMN portion has been dropped, retaining only the columns list in parentheses. Also, the clause has been moved so that it is right after the import file name. The DELIMITER clause has been renamed to DELIMITER CHAR. The QUOTE CHAR clause has been added to allow you to specify the quote character to be used for string values. The DATE clause has been renamed to the DATE FORMAT clause. The TIME clause has been renamed to the TIME FORMAT clause. The DECIMAL clause has been renamed to the DECIMAL CHAR clause. The BOOLEAN clause has been added to allow you to specify the literals used for True and False, respectively. The WITH HEADERS clause has been renamed to the USE

	HEADERS clause and has been moved to right after the BOOLEAN clause. The MAX ROWS clause has been added to allow you to specify the maximum number of rows that should be imported from the file.
EXPORT TABLE	The IF EXISTS clause is no longer supported. ElevateDB uses catalog queries to determine if a table exists. Please see the System Information topic for more information. The COLUMNS clause has been renamed and the COLUMN portion has been dropped, retaining only the columns list in parentheses. Also, the clause has been moved so that it is right after the export file name. The DELIMITER clause has been renamed to DELIMITER CHAR. The QUOTE CHAR clause has been added to allow you to specify the quote character to be used for string values. The DATE clause has been renamed to the DATE FORMAT clause. The TIME clause has been renamed to the TIME FORMAT clause. The DECIMAL clause has been renamed to the DECIMAL CHAR clause. The BOOLEAN clause has been added to allow you to specify the literals used for True and False, respectively. The WITH HEADERS clause has been renamed to the INCLUDE HEADERS clause and has been moved to right after the BOOLEAN clause. The MAX ROWS clause has been added to allow you to specify the maximum number of rows that should be exported to the file.
OPTIMIZE TABLE	The IF EXISTS clause is no longer supported. ElevateDB uses catalog queries to determine if a table exists. Please see the System Information topic for more information. The ON clause has been renamed to the USING INDEX clause. The NOBACKUP clause has been renamed to the NO BACKUP FILES clause.
REPAIR TABLE	The IF EXISTS clause is no longer supported. ElevateDB uses catalog queries to determine if a table exists. Please see the System Information topic for more information. The FORCEINDEXREBUILD clause is no longer supported.

New Statements

The following are the new statements:

New	Description
CREATE DATABASE	Creates a new database.
ALTER DATABASE	Alters an existing database.
DROP DATABASE	Drops an existing database.
RENAME DATABASE	Renames an existing database.
CREATE STORE	Creates a new file store.
ALTER STORE	Alters an existing file store.
DROP STORE	Drops an existing file store.
RENAME STORE	Renames an existing file store.
CREATE USER	Creates a new user.
ALTER USER	Alters an existing user.
DROP USER	Drops an existing user.
RENAME USER	Renames an existing user.
CREATE ROLE	Creates a new role.
ALTER ROLE	Alters an existing role.
DROP ROLE	Drops an existing role.
RENAME ROLE	Renames an existing role.
GRANT PRIVILEGES	Grants privileges to an existing user or role on a specified object.
REVOKE PRIVILEGES	Revokes privileges for an existing user or role from an existing object.
GRANT ROLES	Grants roles to an existing user.
REVOKE ROLES	Revokes roles from an existing user.
CREATE JOB	Creates a new job.
ALTER JOB	Alters an existing job.
DROP JOB	Drops an existing job.
RENAME JOB	Renames an existing job.
CREATE MODULE	Creates (registers) a new external module.
ALTER MODULE	Alters an existing external module.
DROP MODULE	Drops an existing external module.
RENAME MODULE	Renames an existing external module.
CREATE TEXT FILTER	Creates a new text filter.
ALTER TEXT FILTER	Alters an existing text filter.

DROP TEXT FILTER	Drops an existing text filter.
RENAME TEXT FILTER	Renames an existing text filter.
CREATE WORD GENERATOR	Creates a new word generator.
ALTER WORD GENERATOR	Alters an existing word generator.
DROP WORD GENERATOR	Drops an existing word generator.
RENAME WORD GENERATOR	Renames an existing word generator.
CREATE MIGRATOR	Creates a new database migrator.
ALTER MIGRATOR	Alters an existing database migrator.
DROP MIGRATOR	Drops an existing database migrator.
RENAME MIGRATOR	Renames an existing database migrator.
CREATE TRIGGER	Creates a new trigger on an existing table.
ALTER TRIGGER	Alters an existing trigger.
DROP TRIGGER	Drops an existing trigger from a table.
RENAME TRIGGER	Renames an existing trigger on a table.
CREATE TEXT INDEX	Creates a new text index on an existing table.
ALTER INDEX	Alters an existing index.
CREATE VIEW	Creates a new view.
ALTER VIEW	Alters an existing view.
DROP VIEW	Drops an existing view.
RENAME VIEW	Renames an existing view.
CREATE FUNCTION	Creates a new function.
ALTER FUNCTION	Alters an existing function.
DROP FUNCTION	Drops an existing function.
RENAME FUNCTION	Renames an existing function.
CREATE PROCEDURE	Creates a new procedure.
ALTER PROCEDURE	Alters an existing procedure.
DROP PROCEDURE	Drops an existing procedure.
RENAME PROCEDURE	Renames an existing procedure.
SET BACKUPS STORE	Sets the current backups store for ElevateDB.
BACKUP DATABASE	Backs up an existing database.
RESTORE DATABASE	Restores a database from a backup.
PUBLISH DATABASE	Publishes an existing database.
UNPUBLISH DATABASE	Unpublishes a database.
SET UPDATES STORE	Sets the current updates store for ElevateDB.
SAVE UPDATES	Saves all logged updates to published tables in an existing database.

LOAD UPDATES	Loads logged updates from an update file into an existing database.
COPY FILE	Copies a file in a store to a new file name, and optionally, store.
RENAME FILE	Renames a file in a store to a new file name.
DELETE FILE	Deletes a file in a store.
SET FILES STORE	Sets the current files store for ElevateDB.
DISCONNECT SERVER SESSION	Disconnects a server session on an ElevateDB Server.
REMOVE SERVER SESSION	Removes a server session from an ElevateDB Server.

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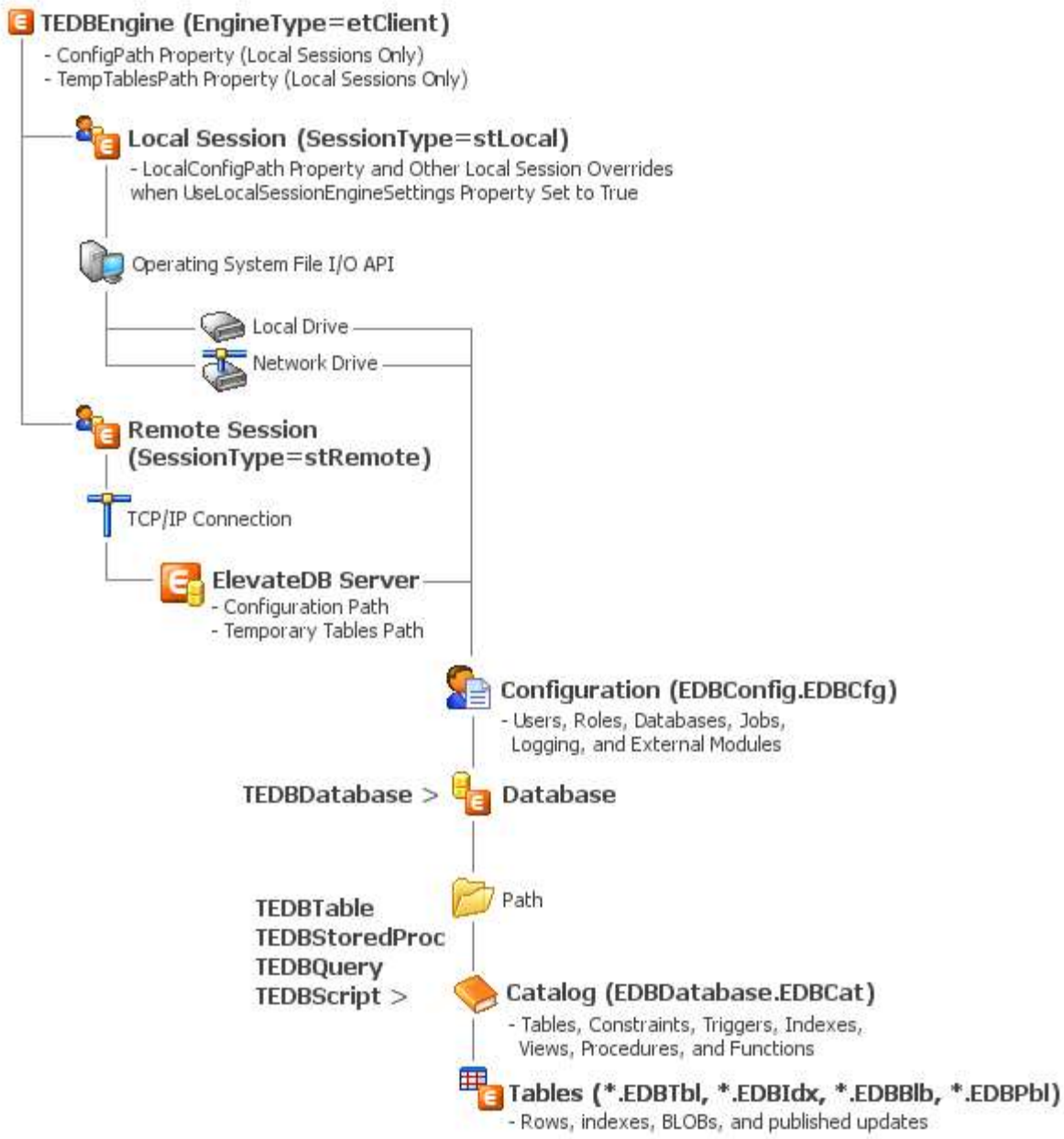
Chapter 4
Getting Started

4.1 Architecture

ElevateDB is a database engine that can be compiled directly into your Embarcadero Delphi, Embarcadero C++, or Lazarus application, be it a program or library, or it can be distributed as a runtime package (equivalent to a library) as part of your application. ElevateDB is available for Delphi 5 and later, as well as Lazarus 0.924 and later. ElevateDB was written in Delphi's Object Pascal language and can be used with the Delphi VCL (Win32, Win64, MacOS32, MacOS64, and Linux64) or Lazarus LCL (Win32, Win64, and Linux64) runtime libraries.

The following image illustrates the general architecture of ElevateDB:



The various components that make up this architecture are detailed next.

Component Architecture

ElevateDB uses a component architecture that includes the following components:

TEDBEngine

The TEDBEngine component encapsulates the ElevateDB engine itself. A TEDBEngine component is created automatically when the application is started and can be referenced via the global Engine function in the edbcomps unit. You can also drop a TEDBEngine component on a form or data-module to change its properties at design-time. However, only one instance of the TEDBEngine component can exist in a given application, and both the global Engine function and any TEDBEngine component on a form or data module point to the same instance of the component (singleton model). The TEDBEngine component can be configured so that it acts like a local or client engine (etClient) or a server engine (etServer) via the EngineType property. The engine can be started by setting the Active property to True.

> **Note**
> Once the engine has been started, most of the properties that configure the engine cannot be modified.

By default, ElevateDB allows you to configure all local sessions via the TEDBEngine component and its ConfigMemory, ConfigPath, ConfigName, and TempTablesPath properties, as well as several other properties that can customize the local session access for a particular application. However, you can also set the UseLocalSessionEngineSettings property to True in order to tell ElevateDB to use the Local* versions of these same properties from the TEDBSession component to override the engine configuration. This is useful for applications that require access to multiple configuration files for multiple local sessions, such as the ElevateDB Manager that is provided with ElevateDB. Please see the Configuring and Starting the Engine topic for more information on the various engine properties that can be modified when configuring local sessions via the TEDBEngine component.

TEDBSession

The TEDBSession component encapsulates a session in ElevateDB. A default TEDBSession component is created automatically when the application is started and can be referenced via the global Session function in the edbcomps unit. The TEDBSession component can be configured so that it acts like a local (stLocal) or a remote session (stRemote) via the SessionType property. A local session is single-tier in nature, meaning that all TEDBDatabase components connected to the session reference databases in a local or network file system and all TEDBTable, TEDBQuery, or TEDBStoredProc components access the physical tables directly from these directories using operating system calls. A remote session is two-tier in nature, meaning that all access is done through the remote session to an ElevateDB Server using a messaging protocol over a TCP/IP connection. A remote session is configured using the following properties:

RemoteHost or RemoteAddress
RemotePort or RemoteService

In a remote session, all TEDBDatabase components reference databases that are defined on the ElevateDB Server and all TEDBTable or TEDBQuery components access the physical tables through the messaging protocol rather than directly through the operating system.

> **Note**
> You cannot connect remote sessions in an application whose TEDBEngine component is configured as a server via the EngineType property.

As mentioned above, a local session is usually configured via the TEDBEngine component. However, if the UseLocalSessionEngineSettings property is set to True, then the Local* versions of the TEDBEngine configuration properties that are found in the TEDBSession component will be used to override the TEDBEngine configuration settings.

A session can be connected by setting the Connected property to True or by calling the Open method. The TEDBSession component contains a SessionName property that is used to give a session a name and a SessionDescription property that is used to assign a description to the session. All session components must have a name before they can be connected. The default TEDBSession component is called "Default". The TEDBDatabase, TEDBTable, TEDBQuery, and TEDBStoredProc components also have a SessionName property and these properties are used to specify which session these components belong to. Setting their SessionName property to "Default" or blank ("") indicates that they will use the default TEDBSession component. Please see the Connecting Sessions topic for more information.

TEDBDatabase

The TEDBDatabase component encapsulates a database in ElevateDB, and is used as an container for all access to a specific database. A database can be opened by setting the Connected property to True or by calling the Open method. A TEDBDatabase component contains a DatabaseName property that is used to give a database a name within the application. All database components must have a name before they can be opened. The TEDBTable, TEDBQuery, and TEDBStoredProc components also have a DatabaseName property and these properties are used to specify which database these components belong to. Please see the Opening Tables and Views topic for more information.

The TEDBDatabase Database property specifies the name of a database that you would like to connect to.

The TEDBDatabase component is used for transaction processing via the StartTransaction, Commit, and Rollback methods. Please see the Transactions topic for more information.

You can execute dynamic SQL on a specific database by using the Execute method. Please see the Executing Queries topic for more information.

TEDBTable

The TEDBTable component encapsulates a cursor on a table or view in ElevateDB. It is used to search,insert, update, or delete rows within the table or view specified by the TableName property. A table or view cursor can be opened by setting the Active property to True or by calling the Open method. The DatabaseName property specifies the name of the database component that references the database where the table or view resides. Please see the Opening Tables and Views topic for more information.

Because the TEDBTable component represents a table or view cursor, you can have multiple TEDBTable components referencing the same table or view. Each TEDBTable component maintains its own active order, filter and range conditions, current row position, row count statistics, etc.

Note
The TEDBTable component descends from the TEDBDBDataSet component, which descends from the TEDBDataSet component, which descends from the common TDataSet component that is the basis for all data access in VCL or CLX applications. None of these lower-level components should be used directly and are only for internal structuring purposes in the class hierarchy.

TEDBQuery

The TEDBQuery component encapsulates a single SQL statement in ElevateDB. This SQL statement may or may not return a result set, but if it does return a result set, then the TEDBQuery component will act as a cursor on the result set in the same way that the TEDBTable component acts as a cursor on a table or view. The SQL statement to execute is specified in the SQL property, and the statement can be executed by setting the Active property to True, by calling the Open method (for SQL statements that definitely return a result set), or by calling the ExecSQL method (for SQL statements that may or may not return a result set). The DatabaseName property specifies the name of the database component that references the database to be used when executing the SQL statement. Please see the Executing Queries topic for more information.

Note
The TEDBQuery component descends from the TEDBDBDataSet component, which descends from the TEDBDataSet component, which descends from the common TDataSet component that is the basis for all data access in Delphi, C++Builder, Borland Developer Studio, CodeGear RAD Studio, and Lazarus. None of these lower-level components should be used directly and are only for internal structuring purposes in the class hierarchy.

TEDBScript

The TEDBScript component encapsulates a single SQL script in ElevateDB. This script may or may not return a result set, but if it does return a result set, then the TEDBScript component will act as a cursor on the result set in the same way that the TEDBTable component acts as a cursor on a table or view. The script to execute is specified in the SQL property, and the script can be executed by setting the Active property to True, by calling the Open method (for scripts that definitely return a result set), or by calling the ExecScript method (for scripts that may or may not return a result set). The DatabaseName property specifies the name of the database component that references the database to be used when executing the script. Please see the Executing Scripts topic for more information.

Note
The TEDBScript component descends from the TEDBDBDataSet component, which descends from the TEDBDataSet component, which descends from the common TDataSet component that is the basis for all data access in Delphi, C++Builder, Borland Developer Studio, CodeGear RAD Studio, and Lazarus. None of these lower-level components should be used directly and are only for internal structuring purposes in the class hierarchy.

TEDBStoredProc

The TEDBStoredProc component encapsulates a single stored procedure in ElevateDB. This stored procedure may or may not return a result set, but if it does return a result set, then the TEDBStoredProc component will act as a cursor on the result set in the same way that the TEDBTable component acts as a

cursor on a table or view. The stored procedure to execute is specified in the StoredProcName property, and the stored procedure can be executed by setting the Active property to True, by calling the Open method (for stored procedures that definitely return a result set), or by calling the ExecProc method (for stored procedures that may or may not return a result set). The DatabaseName property specifies the name of the database component that references the database to be used when executing the stored procedure. Please see the Executing Stored Procedures topic for more information.

Note
The TEDBStoredProc component descends from the TEDBDBDataSet component, which descends from the TEDBDataSet component, which descends from the common TDataSet component that is the basis for all data access in Delphi, C++Builder, Borland Developer Studio, CodeGear RAD Studio, and Lazarus. None of these lower-level components should be used directly and are only for internal structuring purposes in the class hierarchy.

Opening a TEDBTable, TEDBQuery, TEDBScript, or TEDBStoredProc component will automatically cause its corresponding TEDBDatabase component to open, which will also automatically cause its corresponding TEDBSession component to connect, which will finally cause the TEDBEngine to start. This design ensures that the necessary connections for a session, database, etc. are completed before the opening of the table, query, or stored procedure is attempted.

4.2 Exception Handling and Errors

One of the first items to address in any application, and especially a database application, is how to anticipate and gracefully handle exceptions. This is true as well with ElevateDB.

ElevateDB Exception Types

ElevateDB uses the EEDBError object as its exception object for all errors. This object descends from the EDatabaseError exception object defined in the common DB unit, which itself descends from the common Exception object. This hierarchy is important since it allows you to isolate the type of error that is occurring according to the type of exception object that has been raised, as you will see below when we demonstrate some exception handling.

> **Note**
> ElevateDB also raises certain component-level exceptions as an EDatabaseError to maintain consistency with the way the common DB unit and TDataSet component behaves. These mainly pertain to design-time property modifications, but a few can be raised at runtime also.

The EEDBError object contains several important properties that can be accessed to discover specific information on the nature of the exception. The ErrorCode property is always populated with a value which indicates the error code for the current exception. Other properties may or may not be populated according to the error code being raised, and a list of all of the error codes raised by the ElevateDB engine along with this information can be found in Appendix A - Error Codes and Messages.

Exception Handling

The most basic form of exception handling is to use the try..except block (Delphi and Lazarus) or try..catch (C++) to locally trap for specific error conditions. The error code that is returned when an open fails due to an exclusive lock problem is 300, which is defined as EDB_ERROR_LOCK in the edberror unit. The following example shows how to trap for such an exception on open and display an appropriate error message to the user:

```
begin
   with MyEDBTable do
      begin
      DatabaseName:='Tutorial';
      TableName:='customer';
      Exclusive:=True;
      ReadOnly:=False;
      try
         Open;
      except
         on E: Exception do
            begin
            if (E is EDatabaseError) and (E is EEDBError) then
               begin
               if (EEDBError(E).ErrorCode=EDB_ERROR_LOCK) then
                  ShowMessage('Cannot open table '+TableName+
                    ', another user has the table open already')
               else
                  ShowMessage('Unknown or unexpected '+
```

```
                    'database engine error # '+
                    IntToStr(EEDBError(E).ErrorCode));
                end
             else
                ShowMessage('Unknown or unexpected '+
                  'error has occurred');
             end;
       end;
       end;
end;
```

Exception Events

Besides trapping exceptions with a try..except or try..catch block, you may also use a global TApplication.OnException event handler to trap database exceptions. However, doing so will eliminate the ability to locally recover from the exception and possibly retry the operation or take some other course of action. There are several events in ElevateDB components that allow you to code event handlers that remove the necessity of coding try..except or try..catch blocks while still providing for local recovery. These events are as follows:

Event	Description
OnEditError	This event is triggered when an error occurs during a call to the TEDBTable, TEDBQuery , or TEDBStoredProc Edit method . The usual cause of an error is a row lock failure if the current session is using the pessimistic row locking protocol (the default). Please see the Inserting, Updating, and Deleting Rows topic for more information on using this event, and the Locking and Concurrency topic for more information on the ElevateDB row locking protocols.
OnDeleteError	This event is triggered when an error occurs during a call to the TEDBTable, TEDBQuery , or TEDBStoredProc Delete method. The usual cause of an error is a row lock failure (a row lock is always obtained before a delete regardless of the locking protocol in use for the current session). Please see the Inserting, Updating, and Deleting Rows topic for more information on using this event, and the Locking and Concurrency topic for more information on the ElevateDB row locking protocols.
OnPostError	This event is triggered when an error occurs during a call to the TEDBTable, TEDBQuery , or TEDBStoredProc Post method. The usual cause of an error is a constraint violation, however it can also be triggered by a row lock failure if the locking protocol for the current session is set to optimistic. Please see the Inserting, Updating, and Deleting Rows topic for more information on using this event, and the Locking and Concurrency topic for more information on the ElevateDB row locking protocols.

4.3 Multi-Threaded Applications

ElevateDB is internally structured to be thread-safe and usable within a multi-threaded application provided that you follow the rules that are outlined below.

Unique Sessions

ElevateDB requires that you use a unique TEDBSession component for every thread that must perform any database access at all. Each of these TEDBSession components must also be assigned a SessionName property value that is unique among all TEDBSession components in the application. Doing this allows ElevateDB to treat each thread as a separate and distinct session and will isolate transactions and other internal structures accordingly. You may use the AutoSessionName property of the TEDBSession component to allow ElevateDB to automatically name each session so that is unique or you may use code similar to the following:

```
var
   LastSessionValue: Integer;
   SessionNameSection: TRTLCriticalSection;

{ Assume that the following code is being executed
  within a thread }

function UpdateAccounts: Boolean;
var
   LocalSession: TEDBSession;
   LocalDatabase: TEDBDatabase;
   LocalQuery:   TEDBQuery;
begin
   Result:=False;
   LocalSession:=GetNewSession;
   try
      LocalDatabase:=TEDBDatabase.Create(nil);
      try
         with LocalDatabase do
            begin
            { Be sure to assign the same session name
              as the TEDBSession component }
            SessionName:=LocalSession.SessionName;
            DatabaseName:='AccountsDB';
            Database:='Accounting';
            Connected:=True;
            end;
         LocalQuery:=TEDBQuery.Create(nil);
         try
            with LocalQuery do
               begin
               { Be sure to assign the same session and
                 database name as the TEDBDatabase
                 component }
               SessionName:=LocalSession.SessionName;
               DatabaseName:=LocalDatabase.DatabaseName;
               SQL.Clear;
               SQL.Add('UPDATE accounts SET PastDue=True');
               SQL.Add('WHERE DueDate < CURRENT_DATE'));
               Prepare;
```

```
               try
                  { Start the transaction and execute the query }
                  LocalDatabase.StartTransaction;
                  try
                     ExecSQL;
                     LocalDatabase.Commit;
                     Result:=True;
                  except
                     LocalDatabase.Rollback;
                  end;
               finally
                  UnPrepare;
               end;
               end;
         finally
            LocalQuery.Free;
         end;
      finally
         LocalDatabase.Free;
      end;
   finally
      LocalSession.Free;
   end;
end;

function GetNewSession: TEDBSession;
begin
   EnterCriticalSection(SessionNameSection);
   try
      LastSessionValue:=LastSessionValue+1;
      Result:=TEDBSession.Create(nil);
      with Result do
         SessionName:='AccountSession'+IntToStr(LastSessionValue);
   finally
      LeaveCriticalSection(SessionNameSection);
   end;
end;

{ initialization in application }
   LastSessionValue:=0;
   InitializeCriticalSection(SessionNameSection);
{ finalization in application }
   DeleteCriticalSection(SessionNameSection);
```

The AutoSessionName property is, by default, set to False so you must specifically turn it on if you want this functionality. You may also use the thread ID of the currently thread to uniquely name a session since the thread ID is guaranteed to be unique within the context of a process.

Unique Databases

Another requirement is that all TEDBDatabase components must also be unique and have values assigned to their SessionName properties that refer to the unique SessionName property of the TEDBSession component defined in the manner discussed above.

Unique Tables, Queries, and Stored Procedures

The final requirement is that all TEDBTable, TEDBQuery, TEDBScript, and TEDBStoredProc components

must also be unique and have values assigned to their SessionName properties that refer to the unique SessionName property of the TEDBSession component defined in the manner discussed above. Also, if a TEDBTable or TEDBQuery component refers to a TEDBDatabase component's DatabaseName property via its own DatabaseName property, then the TEDBDatabase referred to must be defined in the manner discussed above.

ISAPI Applications

ISAPI applications created using the WebBroker components or a similar technology are implicitly multi-threaded. Because of this, you should ensure that your ISAPI application is thread-safe according to these rules for multi-threading when using ElevateDB. Also, if you have simply dropped a TEDBSession component on the WebModule of a WebBroker ISAPI application, you must set its AutoSessionName property to True before dropping any other ElevateDB components on the form so that ElevateDB will automatically give the TEDBSession component a unique SessionName property and propogate this name to all of the other ElevateDB components.

Further Considerations

There are some other things to keep in mind when writing a multi-threaded database application with ElevateDB, especially if the activity will be heavy and there will be many threads actively running. Be prepared to handle any errors in a manner that allows the thread to terminate gracefully and properly free any TEDBSsion, TEDBDatabase, TEDBTable, TEDBQuery, and TEDBStoredProc components that it has created. Otherwise you may run into a situation where memory is being consumed at an alarming rate. Finally, writing multi-threaded applications, especially with database access, is not a task for the beginning developer so please be sure that you are well-versed in using threads and how they work before jumping into writing a multi-threaded application with ElevateDB.

4.4 Recompiling the ElevateDB Source Code

In some cases you may want to change the ElevateDB source code and recompile it to incorporate these changes into your application. However, you must first have purchased the ElevateDB client and/or server source code in order to make changes to the source code.

Setting Search Paths

The first thing that you must do is make sure that any search paths, either global to ElevateDB such as the Library Search Path or local to your project, are pointing to the directory or path where the ElevateDB source code was installed. By default this directory or path is:

```
\<base directory>\<product>\<compiler> <n>\code\source
```

The <product> component of the path can be one of the following values:

Value	Description
ElevateDB <type> STD-SRC	This indicates the standard version of ElevateDB with source code
ElevateDB <type> CS-SRC	This indicates the client-server version of ElevateDB with source code

The <type> component of the product name will be either VCL or DAC.

The <compiler> <n> component of the path indicates the development environment in use and the version number of the development environment. For example, for Delphi 6 this component would look like this:

```
Delphi 6
```

Setting Compiler Switches

The second thing that must be done is to make sure that the compiler switches that you are using are set properly for ElevateDB. The build system used to compile ElevateDB here at Elevate Software uses the dcc32.exe and dcc64.exe command-line compilers provided with Delphi, C++Builder, Borland Developer Studio, CodeGear RAD Studio, and Embarcadero RAD studio to compile ElevateDB. The following switches are set during compilation and any other switches are assumed to be at their default state for the compiler:

```
$D-   Debug information off
$L-   Local symbols off
```

Note
These same switches are used to compile all ElevateDB utilities and the ElevateDB Server project also.

A Word of Caution

Making changes to the ElevateDB source code is not an easy task. A mistake in such changes could result in the loss of critical data and Elevate Software cannot be held responsible for any losses incurred from such changes. Occasionally our support staff may send a fix to a customer that owns the source code in order to facilitate a quicker turnaround on a bug report, but it is the responsibility of the customer to weigh the risks of implementing such a change with the possible problems that such a change could bring about. Elevate Software tries very hard to also assist any customers that do want to make changes to the ElevateDB source code for custom purposes and will always make an attempt to guide the customer to a solution that fits their needs and is reliable in operation. In general, however, it is usually recommended that you use the generic configuration facilities provided with ElevateDB as opposed to making direct changes to the source code. Please see the Configuring and Starting the Engine topic for more information.

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Chapter 5
Using ElevateDB

5.1 Configuring and Starting the Engine

Configuring the Engine

As already discussed in the Architecture topic, the TEDBEngine component represents the engine in ElevateDB. The following information will show how to configure the engine for use as a client engine in an application or as an server engine. The TEDBEngine EngineType property controls whether the engine is behaving as a local engine or a server engine.

> **Note**
> The TEDBEngine component must be inactive (Active=False) when modifying any of the configuration properties.

Character Set

The TEDBEngine CharacterSet property specifies which character set, ANSI or Unicode, to use for reading and writing the configuration file and all databases and tables. This property defaults to a value that matches the default string type used by the current compiler. For example, with Delphi XE the default string type is a Unicode string, so this property will default to csUnicode when used with Delphi XE. This setting can be overridden on a per-session basis by modifying the TEDBSession CharacterSet property.

Configuration Path

The TEDBEngine ConfigMemory and ConfigPath properties specify where the engine should look for the configuration file to use for the application, if running as a client engine, or the server, if running as a server engine. The configuration file is used to store the information in the Configuration database in ElevateDB. If the ConfigMemory property is set to True, then the configuration file will be "virtual" and stored in the process memory. If the ConfigMemory property is False and the path specified for the ConfigPath property does not exist, then an error will be raised when the engine is started (Active=True). If the path exists, but the configuration file does not exist in the path, then the ElevateDB engine will create the configuration file as necessary.

> **Note**
> It is very important that you do not have more than one instance of the ElevateDB engine using different configuration files (including mixing virtual and non-virtual configuration files) and accessing the same database(s). Doing so will cause locking errors. All instances of the ElevateDB engine must use the same type of configuration file (virtual or disk-based) and, if disk-based, the same configuration file if they will be accessing the same database(s).

Temporary Tables Path

The TEDBEngine TempTablesPath property controls where ElevateDB creates any temporary tables that

are required for storing query result sets. By default, the TempTablesPath property is set to the user-specific temporary tables path for the operating system.

Engine Signature

The TEDBEngine Signature property controls the engine signature for the engine. The default engine signature is "edb_signature". The engine signature in ElevateDB is used to "stamp" all configuration files, catalog files, table files, backup files, update files, and streams created by the engine so that only an engine with the same signature can open them or access them afterwards. If an engine does attempt to access an existing table, backup file, update file, or stream with a different signature than that of the table, backup file, update file, or stream, an EEDBError exception will be raised. The error that is raised when the access fails due to an invalid engine signature is 100 (EDB_ERROR_VALIDATE).

Also, if the EngineType property is set to etClient, the engine signature is used to stamp all requests sent from a remote session to an ElevateDB Server. If the ElevateDB Server is not using the same engine signature, then the requests will be treated as invalid and rejected by the ElevateDB Server. If the EngineType property is set to etServer, the engine signature is used to stamp all responses sent from the ElevateDB Server to any remote session. If the remote session is not using the same engine signature then the requests will be treated as invalid and rejected by the ElevateDB Server. In summary, both the remote sessions and the ElevateDB Server must be using the same engine signature or else communications between the two will be impossible.

Note
It is important to note that ElevateDB can always open any file that is stamped with the default signature, as well as communicate with any ElevateDB Server using the default signature, even if the engine signature has been changed to use a custom signature. Therefore, it is important that one make sure that the engine signature is changed *before* any files are created that one wants to be stamped with the custom engine signature.

Encryption Password

You can use the EncryptionPassword property to modify the encryption password used by ElevateDB for all file encryption purposes. ElevateDB uses this password for all configuration, database catalog (for encrypted catalogs), and table files (for encrypted tables) encryption. The default encryption password is 'elevatesoft'.

ElevateDB uses the Blowfish block cipher encryption algorithm with 128-bit MD5 hash keys for encryption. Please see the Encryption topic for more information.

Licensed Sessions

You can specify that a certain maximum number of concurrent licensed sessions be allowed by modifying the TEDBEngine LicensedSessions property. The default value for this property is 4096 sessions. Setting this property to a lower figure will allow no more than the specified number of sessions to concurrently access the same configuration.

Buffered File I/O

You can specify whether to enable buffered file I/O in ElevateDB by modifying the TEDBEngine BufferedFileIO property. The default value for this property is False. If you enable buffered file I/O, you can use the BufferedFileIOSettings and BufferedFileIOFlushInterval properties to control how the buffered file I/O behaves.

The following is an example of how the buffered file I/O could be configured:

```
Engine.BufferedFileIO:=True;
with Engine.BufferedFileIOSettings do
   begin
   { Lock files don't use buffering }
   Add('"*EDBConfig.EDBLck",1,1,0,False');
   Add('"*EDBDatabase.EDBLck",1,1,0,False');
   { Configuration and catalog files:
     64KB block size
     4MB buffer size
     0-second flush age (always write any dirty buffers during flush checks)
     Always force flush to disk call in OS }
   Add('"*EDBDatabase.EDBCfg",64,4,0,True');
   Add('"*EDBDatabase.EDBCat",64,4,0,True');
   { Smaller database table files:
     64KB block size
     32MB buffer size
     120-second flush age
     Don't force flush to disk call in OS }
   Add('"*Customer.EDBTbl",64,32,120,False');
   Add('"*Customer.EDBIdx",64,32,120,False');
   Add('"*Customer.EDBBlb",64,32,120,False');
   { Larger database table files:
     64KB block size
     128MB-256MB buffer sizes
     120-second flush age
     Don't force flush to disk call in OS }
   Add('"*Orders.EDBTbl",64,128,120,False');
   Add('"*Orders.EDBIdx",64,256,120,False');
   Add('"*Orders.EDBBlb",64,256,120,False');
   end;
```

Please see the Buffering and Caching topic in the SQL manual for more information on buffered file I/O in ElevateDB.

File Names and Extensions

The following file customziations can be made for the engine:

File	Description
Configuration File	The ConfigName property determines the root name (without extension) used by the engine for the configuration file. The extension used for the configuration file is determined by the ConfigExtension property. The location of the configuration file is determined by the ConfigPath property.
Configuration Lock File	The ConfigName property determines the root name (without extension) used by the engine for the configuration lock file. The extension used for the configuration lock file is determined by the LockExtension property. The location of the configuration lock file is determined by the ConfigPath property, and the configuration lock file is hidden, by default.

Configuration Log File	The ConfigName property determines the root name (without extension) used by the engine for the configuration log file. The extension used for the configuration log file is determined by the LogExtension property. The location of the configuration log file is determined by the ConfigPath property. The maximum size of the log file can be controlled via the MaxLogFileSize property. Log entries are added to the log in a circular fashion, meaning that once the maximum log file size ia reached, ElevateDB will start re-using the oldest log entries for new log entries. The default value is 1048576 bytes. Which types of logged events are recorded in the log can be controlled by the LogCategories property. By default, all categories of events are logged (Information, Warning, or Error). **Warning** It is very important that all applications accessing the same configuration file use the same maximum log file size for the configuration log file. Using different values can result in log entries being prematurely overwritten or appearing "out-of-order" when viewing the log entries via the LogEvents Table.
Catalog File	The CatalogName property determines the root name (without extension) used by the engine for all database catalog files. The extension used for the catalog files is determined by the CatalogExtension property. The location of the catalog file is determined by the path designated for the applicable database when the database was created. Please see the Creating, Altering, or Dropping Configuration Objects topic for more information.
Catalog Lock File	The CatalogName property determines the root name (without extension) used by the engine for the database catalog lock files. The extension used for a catalog lock file is determined by the LockExtension property. The location of a catalog lock file is determined by the path designated for the applicable database when the database was created, and a catalog lock file is hidden, by default. Please see the Creating, Altering, or Dropping Configuration Objects topic for more information.
Backup File	The BackupExtension property determines the extension used for all backup files created by ElevateDB. Please see the Backing Up and Restoring Databases topic for more information.
Update File	The UpdateExtension property determines the extension used for all update files created by ElevateDB. Please see the Saving Updates To and Loading Updates From Databases topic for more information.
Table Files	The TableExtension determines the extension used for all table files used by ElevateDB, the TableIndexExtension determines the extension used for all table index files, the TableBlobExtension determines the extension used for all

	table BLOB files, and the TablePublishExtension determines the extension used for all table publish files. Every table in an ElevateDB database has at least a table file and a table index file. If the table contains BLOB columns, then it will also have a table BLOB file. If the table is published, then it will also have a table publish file. The location of the table files is determined by the path designated for the applicable database when the database was created. Please see the Creating, Altering, or Dropping Configuration Objects topic for more information.

Server Configuration

There are no extra steps required in order to use the TEDBEngine component in ElevateDB as a client engine since the default value of the EngineType property is etClient. However, in order to use the TEDBEngine component in ElevateDB as an ElevateDB Server you will need to make some property changes before starting the engine.

The TEDBEngine component has several key properties that are used to configure the ElevateDB Server, which are described below in order of importance:

Property	Description
EngineType	In order to start the TEDBEngine component as an ElevateDB Server, you must set this property to etServer.
ServerName	This property is used to identify the ElevateDB Server to external clients once they have connected to the ElevateDB Server. The default value is "EDBSrvr".
ServerDescription	This property is used in conjunction with the ServerName property to give more information about the ElevateDB Server to external clients once they have connected to the ElevateDB Server. The default value is "ElevateDB Server".
ServerAddress	This property specifies the IP address that the ElevateDB Server should bind to when listening for incoming connections from remote sessions. The default value is blank (""), which specifies that the ElevateDB Server should bind to all available IP addresses.
ServerPort	This property specifies the port that the ElevateDB Server should bind to when listening for incoming connections from remote sessions. The default value is 12010.
ServerThreadCacheSize	This property specifies the number of threads that the ElevateDB Server should actively cache for connections. When a thread is terminated in the server it will be added to this thread cache until the number of threads cached reaches this property value. This allows the ElevateDB Server to re-use the threads from the cache instead of having to constantly create/destroy the threads as needed, which can improve the performance of the ElevateDB Server if there are many connections and disconnections occurring. The default value is 10.
ServerEncryptionPassword	This property specifies the encryption password used by the ElevateDB Server for encrypting all communications with

	remote sessions. The default encryption password is 'elevatesoft'. ElevateDB uses the Blowfish block cipher encryption algorithm with 128-bit MD5 hash keys for encryption. Please see the Encryption topic for more information.
ServerEncryptedOnly	This property specifies whether all incoming connections from remote sessions should be encrypted or not. If this property is set to True, then all incoming connections to the ElevateDB Server that are not encrypted will be rejected with the error code 1105 (EDB_ERROR_ENCRYPTREQ). The default value is False. **Note** If you intend to use encrypted connections to an ElevateDB Server over a public network then you should always use a different ServerEncryptionPassword from the default password.
ServerSessionTimeout	This property specifies how long the server engine should wait for a request from a connected remote session before it disconnects the session. This is done to keep the number of concurrent connections at a minimum. Once a session has been disconnected by the server engine, the session is then considered to be "dead" until either the remote session reconnects to the session in the server, or the server removes the session according to the parameters specified by the ServerDeadSessionInterval,ServerDeadSessionExpiration, or ServerMaxDeadSessions properties (see below). A remote session may enable pinging via the TEDBSession RemotePing property in order to prevent the server engine from disconnecting the remote session due to the ServerSessionTimeout property. The default value for this property is 180 seconds, or 3 minutes.
ServerDeadSessionInterval	This property controls how often the server engine will poll the disconnected sessions to see if any need to be removed according to the ServerDeadSessionExpiration, or ServerMaxDeadSessions properties (see below). The default value is 30 seconds.
ServerDeadSessionExpiration	This property controls how long a session can exist in the server in a disconnected, or "dead", state before the server engine removes the session. This is done to prevent a situation where "dead" sessions accumulate from client applications whose network connections were permanently interrupted.

	Note If all of the remote sessions accessing the server are using pinging via the TEDBSession RemotePing property, then you should set this property to the minimum value of 10 seconds so that sessions are removed as soon as they stop pinging the server. The default value for this property is 300 seconds, or 5 minutes.
ServerMaxDeadSessions	This property controls how many "dead" sessions can accumulate in the server before the server engine begins to remove them immediately, irrespective of the ServerDeadSessionExpiration property above. If the ServerMaxDeadSessions property is exceeded, then the server engine removes the "dead" sessions in oldest-to-youngest order until the number of "dead" sessions is at or under the ServerMaxDeadSessions property setting. The default value for this property is 64.
ServerAuthorizedAddresses	This property controls which IP addresses are authorized to access the server. This is commonly referred to as a "white list". There is no limit to the number of addresses that can be specified, and the IP address entries may contain the asterisk (*) wildcard character to represent any portion of an address.
ServerBlockedAddresses	This property controls which IP addresses are not allowed to access the server. This is commonly referred to as a "black list". There is no limit to the number of addresses that can be specified, and the IP address entries may contain the asterisk (*) wildcard character to represent any portion of an address.
ServerRunJobs	This property controls whether the server engine is allowed to schedule and run jobs that are defined in the Configuration database. If this property is set to True (the default), then the ServerJobCategory property below determines which category of jobs that the server will schedule and run.
ServerJobCategory	This property controls which job category the server will schedule and run if the ServerRunJobs property is set to True. This property can contain any value, and the default value is blank (''), which indicates that the server engine can run all job categories. A job category is assigned to each job when it is created via the CREATE JOB DDL statement.
OnServerSessionEvent	Attach an event handler for this event in order to take certain actions when a remote session connects, reconnects, logs in, logs out, or disconnects from the server.
ServerTrace	This property controls whether the server will trigger the OnServerTrace event for every request and response to/from the server.

	Warning Do not enable this property in production without being aware of the consequences. Enabling this property can result in a significant amount of overhead, depending upon how the OnServerTrace event is handled. In the ElevateDB Server project that is provided with ElevateDB (see below), enabling this property will generate a large number of trace files that can easily consume large amounts of disk space on a busy server.

ElevateDB comes with a default GUI ElevateDB Server project for Delphi called edbsrvr.dpr (Windows only). You can examine the source code of these projects to see how you would go about setting up a TEDBEngine component as an ElevateDB Server in a project. Both of these projects are also provided in compiled form with ElevateDB. You can find these servers in the \servers\edbsrvr subdirectories under the main ElevateDB installation directory, and you can find the source code to these servers in the \source subdirectory under each server's directory.

Starting the Engine

Once you have configured the engine using the above information, starting the engine is quite simple. All you need to do is set the Active property to True. The following shows an example of how one might configure and start an ElevateDB Server using the default global Engine function in the edbcomps unit (Delphi and Lazarus) or edbcomps header file (C++):

```
with Engine do
   begin
   ConfigPath:='\MyApplication';
   ServerName:='MyTestServer';
   ServerDescription:='My Test Server';
   { Only listen on this IP address }
   ServerAddress:='192.168.0.1';
   Active:=True;
   end;
```

Note
You can use the TEDBEngine BeforeStart event to configure the TEDBEngine component before it is started. Likewise, you can use the AfterStart, BeforeStop, and AfterStop events to respond to the engine being started or stopped.

5.2 Connecting Sessions

As already discussed in the Architecture topic, the TEDBSession component represents a session in ElevateDB. The following information will show how to connect a session in an application.

Preparing a Local Session for Connection

If a TEDBSession component has its SessionType property set to stLocal, then it is considered a local session as opposed to a remote session. A local session must have values assigned to the LoginUser and LoginPassword properties if you do not wish to have ElevateDB display a login dialog when the session is connected.

The default Administrator user and password for an ElevateDB configuration is:

```
User: Administrator (case-insensitive)
Password: EDBDefault (case-sensitive)
```

Preparing a Remote Session for Connection

If a TEDBSession component has its SessionType property set to stRemote, then it is considered a remote session as opposed to a local session. In addition to the Login* properties detailed above that are required for a local or remote session, there are some additional properties for remote sessions that must be specified.

Connecting a remote session will cause ElevateDB to attempt a connection to the ElevateDB Server specified by the RemoteAddress or RemoteHost and RemotePort or RemoteService properties, and the RemoteConnectionTimeout property will indicate how long the remote session will wait for a successful connection attempt. In addition, the RemoteSignature property indicates the signature that the session's connection to the ElevateDB Server will be signed with, and the RemoteEncryption property indicates whether the session's connection to the ElevateDB Server will be encrypted using the RemoteEncryptionPassword property. You must set these properties properly before trying to connect the remote session or an exception will be raised.

Note
Even if a session is not encrypted by setting the RemoteEncryption property to True, any login information is encrypted using the RemoteEncryptionPassword property during session login, so the RemoteEncryptionPassword must always match the corresponding server encryption password for session communciations or logins to the ElevateDB Server will fail. Please see the Configuring and Starting the Engine topic for more information on how to configure the server encryption passowrd used with session communications.

The RemoteAddress and RemoteHost properties are normally mutually exclusive. They can both be specified, but the RemoteHost property will take precedence. The host name used for the server can be specified via the "hosts" text file available from the operating system. In Windows, for example, it is located in the Windows\System32\Drivers\Etc directory. Adding an entry in this file for the ElevateDB Server will allow you to refer to the ElevateDB Server by host name instead of IP address. The following is an example of an entry for an ElevateDB Server running on a LAN:

```
192.168.0.1     ElevateDBServer
```

This is sometimes more convenient than remembering several IP addresses for different ElevateDB Servers. It also allows the IP address to change without having to modify your application.

The RemotePort and RemoteService properties are also normally mutually exclusive. They can both be specified, but the RemoteService property will take precedence. By default the port that ElevateDB Servers use is 12010. This port can be changed, however, so check with your administrator or person in charge of the ElevateDB Server configuration to verify that this is the port being used.

The service name used for the ElevateDB Server can be specified via the "services" text file available from the operating system. In Windows, for example, it's located in the \Windows\System32\Drivers\Etc directory. Adding an entry to this file for the ElevateDB Server's port will allow you to refer to the server's port by service name instead of port number. The following is an example of an entry for the server:

```
ElevateDBServer     12010/tcp
```

This is sometimes more convenient than remembering the port numbers for different ElevateDB Servers. It also allows the port number to change without having to modify your application.

The RemoteEncryption property can be set to either True or False and determines whether the session's connection to the server will be encrypted or not. If this property is set to True, the RemoteEncryptionPassword property is used to encrypt and decrypt all data transmitted to and from the ElevateDB Server. This property must match the same encryption password that the ElevateDB Server is using for communications with remote sessions (TEDBEngine ServerEncryptionPassword property) or else an exception will be raised when a request is attempted on the server.

If for any reason the remote session cannot connect to an ElevateDB Server, an exception will be raised. The error that is raised when a connection fails is 1100 (EDB_ERROR_CLIENTCONN). It's also possible for ElevateDB to be able to connect to the server, but the connection will be rejected due to the ElevateDB Server blocking the client workstation's IP address from accessing the server (1104 and defined as EDB_ERROR_ADDRBLOCK), or an encrypted connection being required by the ElevateDB Server (1105 and defined as EDB_ERROR_ENCRYPTREQ).

Connecting a Session

To connect a session you must set the TEDBSession Active property to True or call its Open method. For a local session (SessionType property is set to stLocal), the session will be opened immediately. As discussed above, for a remote session (SessionType property is set to stRemote), performing this operation will cause the session to attempt a connection to the ElevateDB Server specified by the RemoteAddress or RemoteHost and RemotePort or RemoteService properties. The connection attempt will wait the number of seconds specified by theRemoteConnectionTimeout property.

For both local and remote sessions, if the LoginUser and LoginPassword properties are specified and are valid, then neither the OnLogin event nor the interactive login dialog will be triggered. If these properties are not specified or are not valid, the OnLogin event will be triggered if there is an event handler assigned to it. If an event handler is not assigned to the OnLogin event, ElevateDB will display an interactive login dialog that will prompt for a user ID and password. All ElevateDB configurations require a user ID and password in order to connect and login. ElevateDB will allow for up to 3 login attempts before issuing an exception. The error that is raised when a connection fails due to invalid login attempts is 501 (EDB_ERROR_LOGIN).

Note
Any version of ElevateDB for Delphi 6 or higher (including C++Builder 6 and higher) requires that you include the DBLogDlg unit in your uses clause in order to enable the display of a default login dialog. This is done to allow for ElevateDB to be included in applications without linking in the Forms unit, which can add a lot of unnecessary overhead and also cause unwanted references to user interface libraries. This is not required for Delphi 5 or C++Builder 5 since these versions always included the Forms unit.

The BeforeConnect event is useful for handling the setting of any properties for the session before the session is connected. This event is called right before the session is connected, so it is useful for situations where you need to change the session properties from values that were used at design-time to values that are valid for the environment in which the application is now running. The following is an example of using an BeforeConnect event handler to set the remote connection properties for a session:

```
procedure TMyForm.MySessionBeforeConnect(Sender: TObject);
var
   Registry: TRegistry;
begin
   Registry:=TRegistry.Create;
   try
      Registry.RootKey:=HKEY_LOCAL_MACHINE;
      if Registry.OpenKey('SOFTWARE/My Application',False) then
         begin
         if Registry.ReadBool('IsRemote') then
            begin
            with MySession do
               begin
               SessionType:=stRemote;
               RemoteAddress:=Registry.ReadString('RemoteAddress');
               RemotePort:=Registry.ReadString('RemotePort');
               end;
            end
         else
            MySession.SessionType:=stLocal;
         end
      else
         ShowMessage('Error reading connection information '+
                     'from the registry');
   finally
      Registry.Free;
   end;
end;
```

Note
You should not call the session's Open method or toggle the Active property from within this event handler. Doing so can cause infinite recursion.

The AfterDisconnect event can be used for taking specific actions after a session has been disconnected. As is the case with the BeforeConnect event, the above warning regarding the Open method or Active property also applies for the AfterDisconnect event.

More Session Properties

A session can also be configured to control several global settings for all TEDBDatabase, TEDBTable, TEDBQuery, TEDBStoredProc, and TEDBScript components that link to the session via their SessionName properties. The properties that represent these global settings are detailed below:

Property	Description
ForceBufferFlush	Controls whether the session will automatically force the operating system to flush data to disk after every write operation completed by ElevateDB. Please see the Buffering and Caching topic for more information. The default value is False.
RecordLockProtocol	Controls whether the session will use a pessimistic or optimistic locking model when editing rows via navigational or SQL methods. Please see the Locking and Concurrency topic for more information. The default value is lpPessimistic.
RecordLockRetryCount	Controls the number of times that the engine will retry a row lock before raising an exception. This property is used in conjunction with the RecordLockWaitTime property. The default value is 15 retries.
RecordLockWaitTime	Controls the amount of time, in milliseconds, that the engine will wait in-between row lock attempts. This property is used in conjuction with the RecordLockRetryCount property. The default value is 100 milliseconds.
RecordChangeDetection	Controls whether the session will detect changes to a row during editing or deletion and issue an error if the row has changed since it was last cached. Please see the Change Detection topic for more information. The default value is False.
KeepConnections	Controls whether temporary TEDBDatabase components are kept connected even after they are no longer needed. This property has no obvious effect upon a local session, but can result in tremendous performance improvements for a remote session, therefore it defaults to True and should be left as such in most cases.
KeepTablesOpen	Controls whether the physical tables opened within the session are kept open even after they are no longer being used by the application. Setting this property to True can dramatically improve the performance of SQL statements and any other operations that involve constantly opening and closing the same tables over and over.
SQLStmtCacheSize	Controls how many SQL statements can be cached in memory for each open database in the session. Caching SQL statements improves the performance of ElevateDB by avoiding very expensive preparation/un-preparation cycles. The default value is 0, which means that SQL statements will not be cached for the session. If a session needs to free any cached SQL statements, it can do so at any time by calling the TEDBSession FreeCachedSQLStmts method.
FuncProcCacheSize	Controls how many functions/procedures can be cached in

	memory for each open database in the session. Caching functions/procedures improves the performance of ElevateDB by avoiding very expensive preparation/un-preparation cycles. The default value is 0, which means that functions/procedures will not be cached for the session. If a session needs to free any cached functions/procedures, it can do so at any time by calling the TEDBSession FreeCachedFuncProcs method.
ProgressTimeInterval	Controls the amount of time, in milliseconds, that must elapse between progress updates before ElevateDB will generate a progress event. The default value is 1000 milliseconds, or 1 second.
ExcludeFromLicensedSessions	Specifies whether the current session should be included in the session license count controlled by the TEDBEngine LicensedSessions property for local sessions, or by the ElevateDB Server for remote sessions. This is useful for situations where you have a utility session that you want to exclude from your own licensing restrictions, such as when a session is used in a thread for performance reasons. **Note** This property does not cause the session to be excluded from the ElevateDB licensed session count and only affects the user-defined licensed session count.

Note
You cannot modify any of the above properties unless the session is disconnected. Attempting to modify these properties while the session is connected will result in an exception being raised.

5.3 Creating, Altering, or Dropping Configuration Objects

Configuration objects are objects that are stored in the ElevateDB configuration file, which is represented by the special system-created Configuration database. Creating, altering, or dropping configuration objects can be accomplished by using the TEDBSession Execute method to execute the desired DDL (Data Definition Language) statement against the Configuration database. This method is always set to execute any passed SQL statement from the context of the Configuration database, which makes it ideal for use in creating, altering, or dropping configuration objects such as databases, users, roles, and jobs with a minimal amount of work.

The following example shows how to create a database called "Test" using the CREATE DATABASE DDL statement:

```
// This example uses a session component that
// has already been created and connected
// called MySession

with MySession do
   Execute('CREATE DATABASE "Test" PATH ''C:\Test'''+
           'DESCRIPTION ''Test Database''');
```

Configuration Object DDL Statements

The following DDL statements can be used to manipulate the various configuration objects available in the Configuration database:

- CREATE USER
- ALTER USER
- DROP USER
- RENAME USER
- CREATE ROLE
- ALTER ROLE
- DROP ROLE
- RENAME ROLE
- GRANT ROLES
- REVOKE ROLES
- GRANT PRIVILEGES
- REVOKE PRIVILEGES
- CREATE DATABASE
- ALTER DATABASE
- DROP DATABASE
- RENAME DATABASE
- CREATE JOB
- ALTER JOB
- DROP JOB
- RENAME JOB
- CREATE MODULE
- ALTER MODULE
- DROP MODULE
- RENAME MODULE
- CREATE MIGRATOR
- ALTER MIGRATOR

- DROP MIGRATOR
- RENAME MIGRATOR
- CREATE TEXT FILTER
- ALTER TEXT FILTER
- DROP TEXT FILTER
- RENAME TEXT FILTER
- CREATE WORD GENERATOR
- ALTER WORD GENERATOR
- DROP WORD GENERATOR
- RENAME WORD GENERATOR
- DISCONNECT SERVER SESSION
- REMOVE SERVER SESSION

Please see the User Security topic for more information on the required privileges to execute the above DDL statements.

Note
Keep in mind that Linux has a case-sensitive file system when specifying path names in any SQL.

5.4 Opening Databases

As already discussed in the ElevateDB Architecture topic, the TEDBDatabase component represents a database in ElevateDB. The following information will show how to open a database in an application.

Preparing a Database for Opening

Before you can open a database using the TEDBDatabase component, you must set a couple of properties. The TEDBDatabase DatabaseName property is the name given to the database within the application and is required for naming purposes only. The Database property should contain the name of an existing database that has already been created using a CREATE DATABASE DDL statement.

Opening a Database

To open a database you must set the TEDBDatabase Connected property to True or call its Open method. For a local TEDBDatabase component whose SessionName property is linked to a local TEDBSession component, the database will cause the local TEDBSession to be opened if it is not already, and then the database will be opened. For a remote database whose SessionName property is linked to a remote TEDBSession component, performing this operation will cause the remote session to attempt a connection to the ElevateDB Server if it is not already connected. If the connection is successful, the database will then be opened.

The BeforeConnect event is useful for handling the setting of any pertinent properties for the TEDBDatabase component before it is opened. This event is triggered right before the database is opened, so it's useful for situations where you need to change the database information from that which was used at design-time to something that is valid for the environment in which the application is now running.

> **Note**
> You should not call the TEDBDatabase Open method or modify the Connected property from within the BeforeConnect event handler. Doing so can cause infinite recursion.

More Database Properties

A TEDBDatabase component has one other property of importance that is detailed below:

Property	Description
KeepConnection	Controls whether the database connection is kept active even after it is no longer needed. This property has no effect upon a local session, but can result in tremendous performance improvements for a remote session, therefore it defaults to True and should be left as such in most cases.

5.5 Creating, Altering, or Dropping Database Objects

Database objects are objects that are stored in an ElevateDB database catalog, which is represented by the special system-created Information schema in every ElevateDB database. Creating, altering, or dropping database objects can be accomplished by using the TEDBDatabase Execute method to execute the desired DDL statement against the target database. This method is always set to execute any passed SQL statement from the context of the target database, which makes it ideal for use in creating, altering, or dropping database objects such as tables, indexes, triggers, views, functions, and procedures with a minimal amount of work.

The following example shows how to create a table called "Customer" using the CREATE TABLE DDL (Data Definition Language) statement:

```
// This example uses a database component that
// has already been created and opened
// called MyDatabase

with MyDatabase do
   Execute('CREATE TABLE "Customer" '+
           '('+
           '"ID" INTEGER GENERATED ALWAYS AS IDENTITY (START WITH 0,
      INCREMENT BY 1), '+
           '"Name" VARCHAR(30) COLLATE "ANSI_CI", '+
           '"Address1" VARCHAR(40) COLLATE "ANSI_CI", '+
           '"Address2" VARCHAR(40) COLLATE "ANSI_CI", '+
           '"City" VARCHAR(30) COLLATE "ANSI_CI", '+
           '"State" CHAR(2) COLLATE "ANSI_CI", '+
           '"Zip" CHAR(10) COLLATE "ANSI_CI", '+
           '"CreatedOn" TIMESTAMP DEFAULT CURRENT_TIMESTAMP, '+
           'CONSTRAINT "ID_PrimaryKey" PRIMARY KEY ("ID"), '+
           'CONSTRAINT "ID_Check" CHECK (ID IS NOT NULL), '+
           'CONSTRAINT "Name_Check" CHECK (Name IS NOT NULL)'+
           ')');
```

Database Object DDL Statements

The following DDL statements can be used to manipulate the various database objects available in a database catalog:

- CREATE TABLE
- ALTER TABLE
- DROP TABLE
- RENAME TABLE
- CREATE INDEX
- CREATE TEXT INDEX
- ALTER INDEX
- DROP INDEX
- RENAME INDEX
- CREATE TRIGGER
- ALTER TRIGGER
- DROP TRIGGER
- RENAME TRIGGER
- CREATE VIEW

- ALTER VIEW
- DROP VIEW
- RENAME VIEW
- CREATE FUNCTION
- ALTER FUNCTION
- DROP FUNCTION
- RENAME FUNCTION
- CREATE PROCEDURE
- ALTER PROCEDURE
- DROP PROCEDURE
- RENAME PROCEDURE

Please see the User Security topic for more information on the required privileges to execute the above DDL statements.

Note
Keep in mind that Linux has a case-sensitive file system when specifying path names in any SQL.

5.6 Executing Queries

Executing SQL queries is accomplished through the ExecSQL and Open methods of the TEDBQuery component, or by setting the Active property to True. Before executing a query you must first specify the source database for the query. The source database is specified via the DatabaseName property of the TEDBQuery component. The actual SQL for the query is specified in the SQL property. You may select whether you want a sensitive or insensitive query result cursor set via the RequestSensitive property. Please see the Result Set Cursor Sensitivity topic for more information.

Setting the DatabaseName Property

You may specify the DatabaseName property using two different methods:

1) The first method is to set the DatabaseName property of the TEDBQuery component to the DatabaseName property of an existing TEDBDatabase component within the application. In this case the actual source database being used will come from the Database property. The following example shows how to use the DatabaseName property to point to an existing TEDBDatabase component for the source database:

```
begin
   with MyDatabase do
      begin
      DatabaseName:='AccountingDB';
      Database:='Accounting';
      Connected:=True;
      end;
   with MyQuery do
      begin
      DatabaseName:='AccountingDB';
      SQL.Clear;
      SQL.Add('SELECT * FROM ledger');
      Active:=True;
      end;
end;
```

Note
The above example does not assign a value to the SessionName property of either the TEDBDatabase or TEDBQuery component because leaving this property blank for both components means that they will use the default session that is automatically created by ElevateDB when the engine is initialized. This session is, by default, a local, not remote, session named "Default" or "". Please see the Connecting Sessions topic for more information.

Another useful feature is using the BeforeConnect event of the TEDBDatabase component to dynamically set the Database property before the TEDBDatabase component attempts to connect to the database. This is especially important when you have the Connected property for the TEDBDatabase component set to True at design-time during application development and wish to change the Database property before the connection is attempted when the application is run.

2) The second method is to enter the name of an existing database directly into the DatabaseName property. In this case a temporary database component will be automatically created, if needed, for the

database specified and automatically destroyed when no longer needed. The following example shows how to use the DatabaseName property to point directly to the desired database without referring to a TEDBDatabase component:

```
begin
   with MySession do
      begin
      SessionName:='Remote';
      SessionType:=stRemote;
      RemoteAddress:='192.168.0.2';
      Active:=True;
      end;
   with MyQuery do
      begin
      SessionName:='Remote';
      DatabaseName:='Accounting';
      SQL.Clear;
      SQL.Add('SELECT * FROM ledger');
      Active:=True;
      end;
end;
```

Setting the SQL Property

The SQL statement is specified via the SQL property of the TEDBQuery component. The SQL property is a TEDBStrings object. You may enter an SQL statement by using the Add method of the SQL property to specify the SQL statement line-by-line. You can also assign the entire SQL to the Text property of the SQL property.

When dynamically building SQL statements that contain literal string constants, you can use the TEDBEngine QuotedSQLStr method to properly format and escape any embedded single quotes in the string. For example, suppose you have a TEdit component that contains the following string:

```
Pete's Garage
```

The string contains an embedded single quote, so it cannot be specified directly without causing an error in the SQL statement.

To build an SQL INSERT statement that inserts the above string into a VARCHAR column, you should use the following code:

```
MyEDBQuery.SQL.Text:='INSERT INTO MyTable '+
   '(MyVarCharColumn) VALUES ('+
   Engine.QuotedSQLStr(MyEdit.Text)+')';
```

Note
If re-using the same TEDBQuery component for multiple query executions, please be sure to call the SQL property's Clear method to clear the SQL from the previous query before calling the Add method to add more SQL statement lines.

Preparing the Query

By default ElevateDB will automatically prepare a query before it is executed. However, you may also manually prepare a query using the TEDBQuery Prepare method. Once a query has been prepared, the Prepared property will be True. Preparing a query parses the SQL, opens all referenced tables, and prepares all internal structures for the execution of the query. You should only need to manually prepare a query when executing a parameterized query. Please see the Parameterized Queries topic for more information.

Executing the Query

To execute the query you should call the TEDBQuery ExecSQL or Open methods, or you should set the Active property to True. Setting the Active property to True is the same as calling the Open method. The difference between using the ExecSQL and Open methods is as follows:

Method	Usage
ExecSQL	Use this method when the SQL statement specified in the SQL property may or may not return a result set. The ExecSQL method can handle both situations.
Open	Use this method only when you know that the SQL statement specified in the SQL property will return a result set. Using the Open method with an SQL statement that does not return a result set will result in an EDatabaseError exception being raised with an error message "Error creating table handle".

Note
The SQL SELECT statement is the only statement that returns a result set. All other types of SQL statements do not.

The following example shows how to use the ExecSQL method to execute an UPDATE statement:

```
begin
   with MyDatabase do
      begin
      DatabaseName:='AccountingDB';
      Database:='Accounting';
      Connected:=True;
      end;
   with MyQuery do
      begin
      DatabaseName:='AccountingDB';
      SQL.Clear;
      SQL.Add('UPDATE ledger SET AccountNo=100');
```

```
      SQL.Add('WHERE AccountNo=300');
      ExecSQL;
      end;
end;
```

Query Execution Plans

If you wish to retrieve a query execution plan for the current execution via the Plan property, then set the RequestPlan property to True before executing the query.

Sensitive Result Set Cursors

If you wish to have a sensitive result set generated from the executed query, then set the RequestSensitive property to True before executing the query. This only requests a sensitive result set cursor, and the query may still generate an insensitive result set cursor based upon the query being executed. Please see the Result Set Cursor Sensitivity topic for more information.

Retrieving Query Information

You can retrieve information about a query both after the query has been prepared and after the query has been executed. The following properties can be interrogated after a query has been prepared or executed:

Property	Description
SQLStatementType	Indicates the type of SQL statement currently ready for execution.

The following properties can only be interrogated after a query has been executed:

Property	Description
Plan	Contains information about how the current query was executed, including any optimizations performed by ElevateDB. This information is very useful in determining how to optimize a query further or to simply figure out what ElevateDB is doing behind the scenes. The Plan property is automatically cleared before each execution of an SQL statement. **Note** Query plans are only generated for SQL SELECT, INSERT, UPDATE, or DELETE statements.
RowsAffected	Indicates the number of rows affected by the current query.
ExecutionTime	Indicates the amount of execution time in seconds consumed by the current query.
ExecutionResult	Indicates the Boolean result of the current SQL execution.

Sensitive	Indicates the whether the result set cursor for the query is sensitive or insensitive. Please see the Result Set Cursor Sensitivity topic for more information.

The following example shows how to use the ExecSQL method to execute an UPDATE SQL statement and report the number of rows affected as well as how long it took to execute the statement:

```
begin
   with MyDatabase do
      begin
      DatabaseName:='AccountingDB';
      Database:='Accounting';
      Connected:=True;
      end;
   with MyQuery do
      begin
      DatabaseName:='AccountingDB';
      SQL.Clear;
      SQL.Add('UPDATE ledger SET AccountNo=100');
      SQL.Add('WHERE AccountNo=300');
      ExecSQL;
      ShowMessage(IntToStr(RowsAffected)+
                  ' rows updated in '+
                  FloatToStr(ExecutionTime)+' seconds');
      end;
end;
```

Tracking the Progress of a Query

To take care of tracking the progress of the query execution, we have provided the TEDBQuery OnProgress event. You may set the Continue parameter of this event to False in your event handler to indicate to ElevateDB that you wish to abort the execution of the current SQL statement.

5.7 Parameterized Queries

Parameters allow the same SQL statement to be used with different data values, and are placeholders for those data values. At runtime, the application prepares the query with the parameters and fills the parameter with a value before the query is executed. When the query is executed, the data values assigned to the parameters are substituted for the parameter placeholder and the SQL statement is executed.

Specifying Parameters in SQL

Parameter markers can be used in SQL SELECT, INSERT, UPDATE, and DELETE statements in place of constants. Parameters are identified by a preceding colon (:). For example:

```
SELECT Last_Name, First_Name
FROM Customer
WHERE (Last_Name=:LName) AND (First_Name=:FName)
```

Parameters are used to pass data values to be used in WHERE clause comparisons and as update values in updating SQL statements such as UPDATE or INSERT. Parameters cannot be used to pass values for Identifiers. The following example uses the TotalParam parameter to pass the data value that needs to be assigned to the ItemsTotal column for the row with the OrderNo column equal to 1014:

```
UPDATE Orders
SET ItemsTotal = :TotalParam
WHERE (OrderNo = 1014)
```

Populating Parameters with the TEDBQuery Component

You can use the TEDBQuery Params property to populate the parameters in an SQL statement with data values. You may use two different methods of populating parameters using the Params property:

- By referencing each parameter by its index position in the available list of parameters
- By reference each parameter by name using the ParamByName method

The following is an example of using the index positions of the parameters to populate the data values for an INSERT SQL statement:

```
begin
   with MyQuery do
      begin
      SQL.Clear;
      SQL.Add('INSERT INTO Country (Name, Capital, Population)');
      SQL.Add('VALUES (:Name, :Capital, :Population)');
      Params[0].AsString := 'Lichtenstein';
      Params[1].AsString := 'Vaduz';
      Params[2].AsInteger := 420000;
      ExecSQL;
      end;
```

```
end;
```

The next block of code is an example of using the TEDBQuery ParamByName method in order to populate the data values for a SELECT SQL statement:

```
begin
   with MyQuery do
      begin
      SQL.Clear;
      SQL.Add('SELECT *');
      SQL.Add('FROM Orders');
      SQL.Add('WHERE CustID = :CustID');
      ParamByName('CustID').AsFloat:=1221;
      Open;
      end;
end;
```

Preparing Parameterized Queries

It is usually recommended that you manually prepare parameterized queries that you intend to execute many times with different parameter values. This can result in significant performance improvements since the process of preparing a query can be time-consuming. The following is an example of inserting 3 rows with different values using a manually-prepared, parameterized query:

```
begin
   with MyQuery do
      begin
      SQL.Clear;
      SQL.Add('INSERT INTO Customer (CustNo, Company');
      SQL.Add('VALUES (:CustNo, :Company)');
      { Manually prepare the query }
      Prepare;
      ParamByName('CustNo').AsInteger:=1000;
      ParamByName('Company').AsString:='Chocolates, Inc.';
      ExecSQL;
      ParamByName('CustNo').AsInteger:=2000;
      ParamByName('Company').AsString:='Flowers, Inc.';
      ExecSQL;
      ParamByName('CustNo').AsInteger:=3000;
      ParamByName('Company').AsString:='Candies, Inc.';
      ExecSQL;
      end;
end;
```

5.8 Querying Configuration Objects

Configuration objects are objects that are stored in the ElevateDB configuration file, which is represented by the special system-created Configuration database. Querying configuration objects can be accomplished by using the TEDBQuery component to execute queries against the Configuration database. This allows you to determine which configuration objects exist in the configuration along with specific information about the configuration objects.

The following example shows how to use a TEDBQuery component containing a SELECT statement to query the Databases Table in the Configuration database in order to see if the "Sales" database exists:

```
// This example uses a query component that
// has already been created and opened
// called MyQuery

with MyQuery do
   begin
   DatabaseName:='Configuration';
   SQL:='SELECT * FROM Databases '+
        'WHERE Name='+Engine.QuotedSQLStr('Sales');
   Open;
   if (RecordCount=1) then
      ShowMessage('The Sales database exists')
   else
      ShowMessage('The Sales database does not exist');
   end;
```

You can also use the TEDBSession Execute method as a quicker method to determine if a configuration object or objects exist. The Execute method returns the number of rows affected or returned by a particular SQL statement, so you can use the return value of an indication of whether any rows exist for the SELECT statement on the Configuration database:

```
// This example uses a session component that
// has already been created and opened
// called MySession

with MySession do
   begin
   if (Execute('SELECT * FROM Databases '+
               'WHERE Name='+Engine.QuotedSQLStr('Sales'))=1) then
      ShowMessage('The Sales database exists')
   else
      ShowMessage('The Sales database does not exist');
   end;
```

5.9 Querying Database Objects

Database objects are objects that are stored in an ElevateDB database catalog, which is represented by the special system-created Information schema in every ElevateDB database. Querying database objects can be accomplished by using the TEDBQuery component to execute queries against the Information Schema for a given database. This allows you to determine which database objects exist in the database along with specific information about the database objects.

The following example shows how to use a TEDBQuery component containing a SELECT statement to query the Tables Table in the Information Schema in order to see if the "Customer" table exists:

```
// This example uses a query component that
// has already been created and opened
// called MyQuery

with MyQuery do
   begin
   DatabaseName:='SalesDB';
   SQL:='SELECT * FROM Information.Tables '+
        'WHERE Name='+Engine.QuotedSQLStr('Customer');
   Open;
   if (RecordCount=1) then
      ShowMessage('The Customer table exists')
   else
      ShowMessage('The Customer table does not exist');
   end;
```

You can also use the TEDBDatabase Execute method as a quicker method to determine if a database object or objects exist. The Execute method returns the number of rows affected or returned by a particular SQL statement, so you can use the return value of an indication of whether any rows exist for the SELECT statement on the Information schema:

```
// This example uses a database component that
// has already been created and opened
// called MyDatabase

with MyDatabase do
   begin
   if (Execute('SELECT * FROM Information.Tables '+
               'WHERE Name='+Engine.QuotedSQLStr('Customer'))=1) then
      ShowMessage('The Customer table exists')
   else
      ShowMessage('The Customer table does not exist');
   end;
```

5.10 Executing Scripts

Executing scripts is accomplished through the ExecScript and Open methods of the TEDBScript component, or by setting the Active property to True. Before executing a script you must first specify the source database for the script. The source database is specified via the DatabaseName property of the TEDBScript component. The actual script is specified in the SQL property.

Setting the DatabaseName Property

You may specify the DatabaseName property using two different methods:

1) The first method is to set the DatabaseName property of the TEDBScript component to the DatabaseName property of an existing TEDBDatabase component within the application. In this case the actual source database being used will come from the Database property. The following example shows how to use the DatabaseName property to point to an existing TEDBDatabase component for the source database:

```
begin
   with MyDatabase do
      begin
      DatabaseName:='AccountingDB';
      Database:='Accounting';
      Connected:=True;
      end;
   with MyScript do
      begin
      DatabaseName:='AccountingDB';
      SQL.LoadFromFile('c:\scripts\GetLedgerEntries.sql');
      Active:=True;
      end;
end;
```

Note
The above example does not assign a value to the SessionName property of either the TEDBDatabase or TEDBScript component because leaving this property blank for both components means that they will use the default session that is automatically created by ElevateDB when the engine is initialized. This session is, by default, a local, not remote, session named "Default" or "". Please see the Connecting Sessions topic for more information.

Another useful feature is using the BeforeConnect event of the TEDBDatabase component to dynamically set the Database property before the TEDBDatabase component attempts to connect to the database. This is especially important when you have the Connected property for the TEDBDatabase component set to True at design-time during application development and wish to change the Database property before the connection is attempted when the application is run.

2) The second method is to enter the name of an existing database directly into the DatabaseName property. In this case a temporary database component will be automatically created, if needed, for the database specified and automatically destroyed when no longer needed. The following example shows how to use the DatabaseName property to point directly to the desired database without referring to a TEDBDatabase component:

```
begin
   with MySession do
      begin
      SessionName:='Remote';
      SessionType:=stRemote;
      RemoteAddress:='192.168.0.2';
      Active:=True;
      end;
   with MyScript do
      begin
      SessionName:='Remote';
      DatabaseName:='Accounting';
      SQL.Clear;
      SQL.Add('SCRIPT ()');
      SQL.Add('BEGIN');
      SQL.Add('   EXECUTE IMMEDIATE ''BACKUP DATABASE Test ');
      SQL.Add('       AS TestBackup TO STORE "Backups" ');
      SQL.Add('       INCLUDE CATALOG'';');
      SQL.Add('END');
      ExecScript;
      end;
end;
```

Setting the SQL Property

The script is specified via the SQL property of the TEDBScript component. You can use the ConvertSQL method to convert a script that consists of a series of SQL statements (INSERT, UPDATE, DELETE, or SELECT) separated by semicolons (;) into a proper ElevateDB script that can be executed by the TEDBScript component.

Preparing the script

By default ElevateDB will automatically prepare a script before it is executed. However, you may also manually prepare a script using the TEDBScript Prepare method. Once a script has been prepared, the Prepared property will be True. Preparing a script compiles the script, opens all referenced tables, and prepares all internal structures for the execution of the script. You should only need to manually prepare a script when executing a script that requires parameters.

Executing the Script

To execute the script you should call the TEDBScript ExecScript or Open methods, or you should set the Active property to True. Setting the Active property to True is the same as calling the Open method. The difference between using the ExecScript and Open methods is as follows:

Method	Usage

ExecScript	Use this method when the script specified in the SQL property may or may not return a result set. The ExecScript method can handle both situations.
Open	Use this method only when you know that the script specified in the SQL property will return a result set. Using the Open method with a script that does not return a result set will result in an EDatabaseError exception being raised with an error message "Error creating table handle".

The following example shows how to use the ExecScript method to execute a script:

```
begin
   with MyDatabase do
      begin
      DatabaseName:='AccountingDB';
      Database:='Accounting';
      Connected:=True;
      end;
   with MyScript do
      begin
      DatabaseName:='AccountingDB';
      SQL.LoadFromFile('UpdateLedgerEntries.SQL');
      Prepare;
      ParamByName('AccountNo').AsString:='00100';
      ExecScript;
      end;
end;
```

Tracking the Progress of a Script

To take care of tracking the progress of the script execution, we have provided the TEDBScript OnProgress event. This event will only be fired if the script contains manual progress update calls specifically included by the script creator.

5.11 Executing Stored Procedures

Executing stored procedures is accomplished through the ExecProc and Open methods of the TEDBStoredProc component, or by setting the Active property to True. Before executing a stored procedure you must first specify the source database for the procedure. The source database is specified via the DatabaseName property of the TEDBStoredProc component. The actual procedure name is specified in the StoredProcName property.

Setting the DatabaseName Property

You may specify the DatabaseName property using two different methods:

1) The first method is to set the DatabaseName property of the TEDBStoredProc component to the DatabaseName property of an existing TEDBDatabase component within the application. In this case the actual source database being used will come from the Database property. The following example shows how to use the DatabaseName property to point to an existing TEDBDatabase component for the source database:

```
begin
   with MyDatabase do
      begin
      DatabaseName:='AccountingDB';
      Database:='Accounting';
      Connected:=True;
      end;
   with MyStoredProc do
      begin
      DatabaseName:='AccountingDB';
      StoredProcName:='GetLedgerEntries';
      Active:=True;
      end;
end;
```

Note
The above example does not assign a value to the SessionName property of either the TEDBDatabase or TEDBStoredProc component because leaving this property blank for both components means that they will use the default session that is automatically created by ElevateDB when the engine is initialized. This session is, by default, a local, not remote, session named "Default" or "". Please see the Connecting Sessions topic for more information.

Another useful feature is using the BeforeConnect event of the TEDBDatabase component to dynamically set the Database property before the TEDBDatabase component attempts to connect to the database. This is especially important when you have the Connected property for the TEDBDatabase component set to True at design-time during application development and wish to change the Database property before the connection is attempted when the application is run.

2) The second method is to enter the name of an existing database directly into the DatabaseName property. In this case a temporary database component will be automatically created, if needed, for the database specified and automatically destroyed when no longer needed. The following example shows how to use the DatabaseName property to point directly to the desired database without referring to a

TEDBDatabase component:

```
begin
   with MySession do
      begin
      SessionName:='Remote';
      SessionType:=stRemote;
      RemoteAddress:='192.168.0.2';
      Active:=True;
      end;
   with MyStoredProc do
      begin
      SessionName:='Remote';
      DatabaseName:='Accounting';
      StoredProcName:='GetLedgerEntries';
      Active:=True;
      end;
end;
```

Setting the StoredProcName Property

The procedure is specified via the StoredProcName property of the TEDBStoredProc component.

Preparing the Stored Procedure

By default ElevateDB will automatically prepare a procedure before it is executed. However, you may also manually prepare a procedure using the TEDBStoredProc Prepare method. Once a procedure has been prepared, the Prepared property will be True. Preparing a procedure compiles the procedure, opens all referenced tables, and prepares all internal structures for the execution of the procedure. You should only need to manually prepare a procedure when executing a procedure that requires parameters.

Executing the Procedure

To execute the procedure you should call the TEDBStoredProc ExecProc or Open methods, or you should set the Active property to True. Setting the Active property to True is the same as calling the Open method. The difference between using the ExecProc and Open methods is as follows:

Method	Usage
ExecProc	Use this method when the procedure specified in the StoredProcName property may or may not return a result set. The ExecProc method can handle both situations.
Open	Use this method only when you know that the procedure specified in the StoredProcName property will return a result set. Using the Open method with a procedure that does not return a result set will result in an EDatabaseError exception being raised with an error message "Error creating table handle".

The following example shows how to use the ExecProc method to execute a procedure:

```
begin
   with MyDatabase do
      begin
      DatabaseName:='AccountingDB';
      Database:='Accounting';
      Connected:=True;
      end;
   with MyStoredProc do
      begin
      DatabaseName:='AccountingDB';
      StoredProcName='UpdateLedgerEntries';
      Prepare;
      ParamByName('AccountNo').AsString:='00100';
      ExecProc;
      end;
end;
```

Tracking the Progress of a Procedure

To take care of tracking the progress of the procedure execution, we have provided the TEDBStoredProc OnProgress event. This event will only be fired if the procedure contains manual progress update calls specifically included by the procedure creator.

5.12 Executing Transactions

A transaction is executed entirely by using the StartTransaction, Commit, and Rollback methods of the TEDBDatabase component. A typical transaction block of code looks like this:

```
begin
   with MyDatabase do
      begin
      StartTransaction(EmptyEDBStringsArray);
      try
         { Perform some updates to the table(s) in this database }
         Commit;
      except
         Rollback;
      end;
      end;
end;
```

The EmptyEDBStringsArray variable is defined in the edbtype unit (Delphi or Lazarus) or edbtype header file (C++) in ElevateDB.

Note
It is very important that you always ensure that the transaction is rolled back if there is an exception of any kind during the transaction. This will ensure that the locks held by the transaction are released and other sessions can continue to update data while the exception is dealt with. Also, if you roll back a transaction it is always a good idea to refresh any open TEDBTable or TEDBQuery components linked to the TEDBDatabase component involved in the transaction so that they reflect the current data and not any data from the transaction that was just rolled back. Along with refreshing, you should make sure that any pending inserts or edits for the TEDBTable or TEDBQuery components are cancelled using the Cancel method before the transaction is rolled back to ensure that the inserts or edits are not accidentally posted using the Post method after the transaction is rolled back (unless that is specifically what you wish to do).

Restricted Transactions

It is also possible with ElevateDB to start a restricted transaction. A restricted transaction is one that specifies only certain tables be part of the transaction. The StartTransaction method accepts an optional array of tables that can be used to specify what tables should be involved in the transaction and, subsequently, locked as part of the transaction (see below regarding locking). If this list of tables is nil (the default), then the transaction will encompass the entire database.

The following example shows how to use a restricted transaction on two tables, the Customer and Orders table:

```
var
   Tables: TEDBStringsArray;
begin
   with MyDatabase do
      begin
```

```
      SetLength(Tables,2);
      Tables[0]:='Customer';
      Tables[1]:='Orders';
      StartTransaction(Tables);
      try
         { Perform some updates to the table(s) in the transaction }
         Commit;
      except
         Rollback;
         raise;
      end;
      end;
end;
```

For more information on transactions in ElevateDB, please see the Transactions topic.

5.13 Creating and Using Stores

A store is simply a named storage area that holds files and includes user security privileges so that you can prevent any accidental destruction or viewing of sensitive files. Creating, altering, and dropping stores, and working with the files contained within them, is accomplished by using the TEDBSession Execute method to execute the CREATE STORE, ALTER STORE, DROP STORE, RENAME STORE,SET FILES STORE, COPY FILE, RENAME FILE, and DELETE FILE statements. You can also attach event handlers to the TEDBSession OnStatusMessage and OnProgress events in order to track any status messages and progress during a file copy operation.

Types of Stores

Stores can be created as either local or remote, and they are defined as follows:

Type	Description
Local	A local store simply points to a local path that is accessible from the current process.
Remote	A remote store is a "virtual" store that is defined locally but actually points to another store on a remote ElevateDB Server. This abstraction of remote stores make the stores very useful because you can transfer files between different machines by simply copying a file from a local store to a remote store, and vice-versa.

Creating a Store

To create a store, you can use the CREATE STORE statement. If, at a later time, you wish to change the store from a local store to a remote store, or vice-versa, you can do so by using the ALTER STORE statement.

Adding Files to a Store

Adding files to a local store can be done via the operating system itself by copying or moving files into the local path used by the local store. However, many times the files will be created using statements such as the BACKUP DATABASE, SAVE UPDATES, or EXPORT TABLE statements. These statements require a local store as the location where the files generated by these operations will be created.

You can also use the COPY FILE, RENAME FILE, and DELETE FILE statements to manipulate files in a given local or remote store. This makes stores very useful because they use the existing ElevateDB remote communications facilities and don't require any extension configuration of the operating system to set up virtual private networks (VPNs) or other elaborate setups.

For example, here's an example of using the COPY FILE statement to copy a backup file from a local store to a remote store.

```
begin
   MySession.Execute('COPY FILE "MyBackup.EDBkp" IN STORE "LocalStore" '+
                     'TO "MyBackup.EDBBkp" IN STORE "RemoteStore"');
end;
```

Tracking the Copy File Progress

To take care of tracking the progress of copying files we have provided the OnProgress and OnStatusMessage events within the TEDBSession component. The OnProgress event will report the progress of the file copy operation and the OnStatusMessage event will report any status messages regarding the file copy operation.

Retrieving Information About Files

To retrieve information about the files in a specific store, you can use the SET FILES STORE statement to specify the store where the files are located, and then use a SELECT statement to query the Files Table in the Configuration Database. The Files table contains information about all of the files in the store specified by the SET BACKUPS STORE statement, with one row per file. Please see the Executing SQL Statements for more information on executing a query.

5.14 Publishing and Unpublishing Databases

Publishing and unpublishing databases is accomplished by using the TEDBSession Execute method to execute the PUBLISH DATABASE and UNPUBLISH DATABASE statements. You can also attach event handlers to the TEDBSession OnStatusMessage event in order to track any status messages during a publish or unpublish operation.

Publishing a database causes ElevateDB to mark all tables that are included in the publishing as published and begin to log all insert, update, or delete operations on the published tables. ElevateDB then will continue to log all such operations until a SAVE UPDATES statement is executed for the published tables, at which time an update file will be created that contains these logged updates, and then remove the logged updates from the log associated with each published table.

The logging of the updates for a published table works as follows for each type of operation:

Operation	Description
Inserts	All modified columns are logged.
Updates	The primary key columns for the pre-update version of the row are logged, and all new modified columns are logged also.
Deletes	The primary key columns for the pre-delete version of the row are logged.

Unpublishing a database causes ElevateDB to mark all tables that are included in the unpublishing as unpublished, and to drop all logged updates for the table, making a backup of the logged updates in the process. The unpublish process effectively undoes the publishing process.

Publishing a Database

When the publish executes, it has to obtain an exclusive lock on all tables that are being published in the specified database. This is due to the fact that publishing a table alters its metadata in the database catalog.

The following example shows how to publish a database called "MyDatabase" using the PUBLISH DATABASE statement and the TEDBSession Execute method:

```
begin
   MySession.Execute('PUBLISH DATABASE "MyDatabase"');
end;
```

You can also, optionally, use the TABLES clause of the PUBLISH DATABASE statement to specify a subset of tables in the DATABASE to publish.

Tracking the Publish Progress

To take care of tracking the status of the publishing we have provided the OnStatusMessage event within the TEDBSession component. The OnStatusMessage event will report any status messages regarding the publishing operation.

Unpublishing a Database

When the unpublish executes, it has to obtain an exclusive lock on all tables that are being unpublished in the specified database. This is due to the fact that unpublishing a table alters its metadata in the database catalog.

The following example shows how to unpublish a database called "MyDatabase" using the UNPUBLISH DATABASE statement and the TEDBSession Execute method:

```
begin
   MySession.Execute('UNPUBLISH DATABASE "MyDatabase"');
end;
```

You can also, optionally, use the TABLES clause of the UNPUBLISH DATABASE statement to specify a subset of tables in the DATABASE to unpublish.

Retrieving Publishing Information

To retrieve information about which tables are published, an when they were published, you can use a SELECT statement to query the Tables Table in the Information schema in the published database. The Tables table contains information about all of the tables in the published database, with one row per table. Please see the Executing SQL Statements for more information on executing a query.

5.15 Saving Updates To and Loading Updates From Databases

Saving updates to databases and loading updates from databases is accomplished by using the TEDBSession Execute method to execute the SAVE UPDATES, SET UPDATES STORE, and LOAD UPDATES statements. You can also attach event handlers to the TEDBSession OnStatusMessage and OnProgress events in order to track any status messages and progress during a save or load operation.

Saving the updates to a database copies the updates to all or some of the tables within the database to a compressed or uncompressed update file in a local store. Loading the updates from a database applies the updates from all or some of the tables in a compressed or uncompressed update file in a local store into the database.

In order to save the updates for a given table or tables in a database, the database table(s) must be published first using the PUBLISH DATABASE statement. Please see the Publishing and Unpublishing Databases topic for more information.

Saving the Updates for a Database

When the updates are saved, a read lock is obtained for all tables whose updates are being saved that prevents any sessions from performing any writes to any of the involved tables in the database until the save completes. However, since the saving of the updates is quite fast, the time during which the tables cannot be changed is usually pretty small. To ensure that the database is available as much as possible for updating, it is recommended that you save the database updates to a file in a local store on a fast hard drive and then copy the file to a store that references a CD, DVD, or other slower device outside of the scope of the database being locked instead of creating the update file directly in the store on the slower device.

The following example shows how to save the updates for a database called "MyDatabase" using the SAVE UPDATES statement and the TEDBSession Execute method:

```
begin
   MySession.Execute('SAVE UPDATES FOR DATABASE "MyDatabase" '+
                     'AS "MyDatabase-Updates-'+
                        Engine.DateToSQLStr(Date)+'" '+
                     'TO STORE "Updates"');
end;
```

Note
You cannot specify a remote store as the location for the update file. It must be a local store. Please see the Creating and Using Stores for more information on stores.

Tracking the Progress of the Saving

To take care of tracking the progress of the saving we have provided the OnProgress and OnStatusMessage events within the TEDBSession component. The OnProgress event will report the progress of the saving operation and the OnStatusMessage event will report any status messages regarding the saving operation.

Retrieving Information from an Update File

To retrieve information about the update files in a specific store, you can use the SET UPDATES STORE statement to specify the store where the update files are located, and then use a SELECT statement to query the Updates Table in the Configuration Database. The Updates table contains information about all of the update files in the store specified by the SET UPDATES STORE statement, with one row per update file. Please see the Executing SQL Statements for more information on executing a query.

Loading the Updates for a Database

When the updates are loaded, a write lock is obtained for all of the tables specified for the load that prevents any sessions from performing any reads or writes to any of the specified tables until the load completes. However, since the execution of a load is quite fast, the time during which the tables cannot be accessed is usually pretty small.

Note
Update files from the same source database should always be loaded in their creation order. For example, if you have 3 update files that have come from two different copies of the database, then the 2 update files from one of the source databases should be loaded in their creation order. The other update file doesn't matter because updates from different source databases can be loaded in any order. You can find out the creation order by querying the Updates table in the Configuration database, as described above in the Retrieving Information from an Update File section.

The following example shows how to load the updates for a database called "MyDatabase" using the LOAD UPDATES statement and the TEDBSession Execute method:

```
begin
   MySession.Execute('LOAD UPDATES FOR DATABASE "MyDatabase" '+
                     'FROM "MyDatabase-Updates-'+
                        Engine.DateToSQLStr(Date)+'" '+
                     'IN STORE "Updates"');
end;
```

Note
You cannot specify a remote store as the location for the update file. It must be a local store. Please see the Creating and Using Stores for more information on stores.

Tracking the Progress of the Loading

To take care of tracking the progress of the loading we have provided the OnProgress and OnStatusMessage events within the TEDBSession component. The OnProgress event will report the progress of the load operation and the OnStatusMessage event will report any status messages regarding the load operation.

5.16 Backing Up and Restoring Databases

Backing up and restoring databases is accomplished by using the TEDBSession Execute method to execute the BACKUP DATABASE, SET BACKUPS STORE, and RESTORE DATABASE statements. You can also attach event handlers to the TEDBSession OnStatusMessage and OnProgress events in order to track any status messages and progress during a backup or restore operation.

Backing up a database copies all or some of the tables within the database, along with (optionally) the database catalog, to a compressed or uncompressed backup file in a local store. Restoring a database copies all or some of the tables in a compressed or uncompressed backup file in a local store into the database, overwriting any tables with the same names that already exist in the database. You can also choose to restore the database catalog during a restore operation, if the database catalog was backed up originally with the tables.

Backing Up a Database

When the backup executes, it obtains a read lock for the entire database that prevents any sessions from performing any writes to any of the tables in the database until the backup completes. However, since the execution of a backup is quite fast, the time during which the tables cannot be changed is usually pretty small. To ensure that the database is available as much as possible for updating, it is recommended that you backup the database to a file in a local store on a fast hard drive and then copy the file to a store that references a CD, DVD, or other slower backup device outside of the scope of the database being locked instead of creating the backup file directly in the store on the slower backup device.

The following example shows how to backup a database called "MyDatabase" using the BACKUP DATABASE statement and the TEDBSession Execute method:

```
begin
   MySession.Execute('BACKUP DATABASE "MyDatabase" '+
                     'AS "MyDatabase-Backup-'+
                        Engine.DateToSQLStr(Date)+'" '+
                     'TO STORE "Backups" '+
                     'INCLUDE CATALOG');
end;
```

Note
You cannot specify a remote store as the location for the backup file. It must be a local store. Please see the Creating and Using Stores for more information on stores.

Tracking the Backup Progress

To take care of tracking the progress of the backup we have provided the OnProgress and OnStatusMessage events within the TEDBSession component. The OnProgress event will report the progress of the backup operation and the OnStatusMessage event will report any status messages regarding the backup operation.

Retrieving Information from a Backup File

To retrieve information about the backup files in a specific store, you can use the SET BACKUPS STORE statement to specify the store where the backup files are located, and then use a SELECT statement to query the Backups Table in the Configuration Database. The Backups table contains information about all of the backup files in the store specified by the SET BACKUPS STORE statement, with one row per backup file. Please see the Executing SQL Statements for more information on executing a query.

Restoring a Database

When the restore executes, it obtains an exclusive lock for the entire database that prevents any sessions from opening the database until the restore completes. However, since the execution of a restore is quite fast, the time during which the database cannot be accessed is usually pretty small.

> **Note**
> The Restore method overwrites any existing database catalogs and tables. You should be very careful when restoring to an existing database to prevent loss of data.

The following example shows how to restore a database called "MyDatabase" using the RESTORE DATABASE statement and the TEDBSession Execute method:

```
begin
   MySession.Execute('RESTORE DATABASE "MyDatabase" '+
                     'FROM "MyDatabase-Backup-'+
                        Engine.DateToSQLStr(Date)+'" '+
                     'IN STORE "Backups" '+
                     'INCLUDE CATALOG');
end;
```

> **Note**
> You cannot specify a remote store as the location for the backup file. It must be a local store. Please see the Creating and Using Stores for more information on stores.

Tracking the Restore Progress

To take care of tracking the progress of the restore we have provided the OnProgress and OnStatusMessage events within the TEDBSession component. The OnProgress event will report the progress of the restore operation and the OnStatusMessage event will report any status messages regarding the restore operation.

5.17 Opening Tables and Views

Opening tables and views can be accomplished through the Open method of the TEDBTable component, or by setting the Active property to True. Before opening a table or view, however, you must first specify the source database of the table or view and the table or view name. The source database of the table or view is specified in the DatabaseName property of the TEDBTable component, and the table or view name is specified in the TableName property.

Setting the DatabaseName Property

You may specify the DatabaseName property using two different methods:

1) The first method is to set the DatabaseName property of the TEDBTable component to the DatabaseName property of an existing TEDBDatabase component within the application. In this case the actual source database being used will come from the Database property. The following example shows how to use the DatabaseName property to point to an existing TEDBDatabase component for the source database:

```
begin
   with MyDatabase do
      begin
      DatabaseName:='AccountingDB';
      Database:='Accounting';
      Connected:=True;
      end;
   with MyTable do
      begin
      DatabaseName:='AccountingDB';
      TableName:='ledger';
      Active:=True;
      end;
end;
```

Note
The above example does not assign a value to the SessionName property of either the TEDBDatabase or TEDBTable component because leaving this property blank for both components means that they will use the default session that is automatically created by ElevateDB when the engine is initialized. This session is, by default, a local, not remote, session named "Default" or "". Please see the Starting Sessions topic for more information.

Another useful feature is using the BeforeConnect event of the TEDBDatabase component to dynamically set the Directory or RemoteDatabase property before the TEDBDatabase component attempts to connect to the database. This is especially important when you have the Connected property for the TEDBDatabase component set to True at design-time during application development and wish to change the Directory or RemoteDatabase property before the connection is attempted when the application is run.

2) The second method is to enter the name of an existing database directly into the DatabaseName property. In this case a temporary database component will be automatically created, if needed, for the database specified and automatically destroyed when no longer needed. The following example shows how to use the DatabaseName property to point directly to the desired database without referring to a

TEDBDatabase component:

```
begin
   with MySession do
      begin
      SessionName:='Remote';
      SessionType:=stRemote;
      RemoteAddress:='192.168.0.2';
      Active:=True;
      end;
   with MyTable do
      begin
      SessionName:='Remote';
      DatabaseName:='Accounting';
      TableName:='ledger';
      Active:=True;
      end;
end;
```

Exclusive and ReadOnly Open Modes

In the above two examples we have left the Exclusive and ReadOnly properties of the TEDBTable component at their default value of False. However, you can use these two properties to control how the table or view is opened and how that open affects the ability of other sessions and users to open the same table or view.

When the Exclusive property is set to True, the table or view specified in the TableName property will be opened exclusively when the Open method is called or the Active property is set to True. This means that neither the current session nor any other session or user may open this table or view again without causing an EEDBError exception. It also means that the table or view open will fail if anyone else has the table or view opened either shared (Exclusive=False) or exclusively (Exclusive=True). The error code raised when a table open fails due to access problems is 300 (EDB_ERROR_LOCK). The following example shows how to trap for such an exception using a try..except block (Delphi and Lazarus) or try..catch block (C++) and display an appropriate error message to the user:

```
begin
   with MySession do
      begin
      SessionName:='Remote';
      SessionType:=stRemote;
      RemoteAddress:='192.168.0.2';
      Active:=True;
      end;
   with MyDatabase do
      begin
      SessionName:='Remote';
      DatabaseName:='AccountingData';
      Database:='Accounting';
      Connected:=True;
      end;
   with MyTable do
      begin
      SessionName:='Remote';
      { We're using a database component for the source
```

```
        database, so we use the same value as the DatabaseName
        property for the TEDBDatabase component above, not
        the same value as the Database property, which
        is the name of the actual database }
      DatabaseName:='AccountingData';
      TableName:='ledger';
      Exclusive:=True;
      ReadOnly:=False;
      try
         Open;
      except
         on E: Exception do
            begin
            if (E is EDatabaseError) and
               (E is EEDBError) then
               begin
               if (EEDBError(E).ErrorCode=EDB_ERROR_LOCK) then
                  ShowMessage('Cannot open table '+TableName+
                              ', another user has the table '+
                              'open already')
               else
                  ShowMessage('Unknown or unexpected database '+
                              'engine error # '+
                              IntToStr(EEDBError(E).ErrorCode));
               end
            else
               ShowMessage('Unknown or unexpected error has occurred');
            end;
      end;
      end;
end;
```

Note
Regardless of whether you are trying to open a table or view exclusively, you can still receive this exception if another user or application has opened the table or view exclusively.

When the ReadOnly property is set to True, the table or view specified in the TableName property will be opened read-only when the Open method is called or the Active property is set to True. This means that the TEDBTable component will not be able to modify the contents of the table or view until the table is closed and re-opened with write access (ReadOnly=False). If any of the physical files that make up a table are marked read-only at the operating system level (such as is the case with CD-ROMs) then ElevateDB automatically detects this condition and sets the ReadOnly property to True. ElevateDB is also able to do extensive read buffering on any table that is marked read-only at the operating system level, so if your application is only requiring read-only access then it would provide a big performance boost to mark the tables as read-only at the operating system level. Finally, if security permissions for any of the physical files that make up the table prevent ElevateDB from opening the table with write access, then ElevateDB will also automatically detect this condition and set the ReadOnly property to True.

Updateable Views

Views behave just like tables in most cases. However, views can only be updated if they are actually flagged as updateable by ElevateDB when they are created. You can find out if a view is updateable by querying the Views Table in the Information Schema for the current database. For a view to be flagged as updateable, it must adhere to the requirements of a query that can generate a sensitive result set cursor.

Please see the Result Set Cursor Sensitivity topic for more information. If a view is not updateable, then it will always have its ReadOnly property set to True when it is opened.

5.18 Closing Tables and Views

Closing tables and views can be accomplished through the Close method of the TEDBTable component, or by setting the Active property to False.

The following example shows how to use the Close method to close a table:

```
begin
   MyTable.Close;
end;
```

Note
Once a table or view is closed you cannot perform any operations on the table or view until the table or view is opened again.

5.19 Navigating Tables, Views, and Query Result Sets

Navigation of tables, views, and query result sets is accomplished through several methods of the TEDBTable, TEDBQuery, TEDBScript, and TEDBStoredProc components. The basic navigational methods include the First, Next, Prior, Last, and MoveBy methods. The Bof and Eof properties indicate whether the row pointer is at the beginning or at the end of the table, view, or query result set, respectively. These methods and properties are used together to navigate a table, view, or query result set.

Moving to the First or Last Row

The First method moves to the first row in the table, view, or query result set based upon the current index order. The Last method moves to the last row in the table, view, or query result set based upon the current index order. The following example shows how to move to the first and last rows in a table:

```
begin
   with MyTable do
      begin
      First;
      {  do something to the first row }
      Last;
      { do something to the last row }
      end;
end;
```

Skipping Rows

The Next method moves to the next row in the table, view, or query result set based upon the current index order. If the current row pointer is at the last row in the table, view, or query result set, then calling the Next method will set the Eof property to True and the row pointer will stay on the last row. The Prior method moves to the previous row in the table, view, or query result set based upon the current index order. If the current row pointer is at the first row in the table, view, or query result set, then calling the Prior method will set the Bof property to True and the row pointer will stay on the first row. The following example shows how to use the First and Next methods along with the Eof property to loop through an entire table:

```
begin
   with MyTable do
      begin
      First;
      while not Eof do
         Next;
      end;
end;
```

The following example shows how to use the Last and Prior methods along with the Bof property to loop backwards through an entire table:

```
begin
   with MyTable do
```

```
      begin
      Last;
      while not Bof do
         Prior;
      end;
end;
```

Skipping Multiple Rows

The MoveBy method accepts a positive or negative integer that represents the number of rows to move by within the table, view, or query result set. A positive integer indicates that the movement will be forward while a negative integer indicates that the movement will be backward. The return value of the MoveBy method is the number of rows actually visited during the execution of the MoveBy method. If the row pointer hits the beginning of file or hits the end of file then the return value of the MoveBy method will be less than the desired number of rows. The following example shows how to use the MoveBy method to loop through an entire table 10 rows at a time:

```
begin
   with MyTable do
      begin
      First;
      while not Eof do
         MoveBy(10);
      end;
end;
```

5.20 Inserting, Updating, and Deleting Rows

Updating of tables, views, and query result sets is accomplished through several methods of the TEDBTable, TEDBQuery, TEDBScript, and TEDBStoredProc components. The basic update methods include the Append, Insert, Edit, Delete, FieldByName, Post, and Cancel methods. The State property indicates whether the current table, view, or query result set is in Append/Insert mode (dsInsert), Edit mode (dsEdit), or Browse mode (dsBrowse). These methods and properties are used together in order to update a table, view, or query result set. Depending upon your needs, you may require additional methods to update BLOB columns within a given table, view, or query result set, and information on how to use these methods are discussed at the end of this topic.

Note
For the rest of this topic, a table, view, or query result set will be referred to as a dataset to reduce the amount of references to both. Also, it is important to note here that a query result set can be either sensitive or insensitive, which affects whether an update to a query result set is permitted or not. Please see the Result Set Cursor Sensitivity topic for more information. Likewise, a view may or may not be updateable depending upon the view definition. Please see the Opening Tables and Views topic for more information on updateable views.

Adding a New Row

The Append and Insert methods allow you to begin the process of adding a row to the dataset. The only difference between these two methods is the Insert method will insert a blank row buffer at the current position in the dataset, and the Append method will add a blank row buffer at the end of the dataset. This row buffer does not exist in the physical datset until the row buffer is posted to the actual dataset using the Post method. If the Cancel method is called, then the row buffer and any updates to it will be discarded. Also, once the row buffer is posted using the Post method it will be positioned in the dataset according to the active index order, not according to where it was positioned due to the Insert or Append methods.

The FieldByName method can be used to reference a specific column for updating and accepts one parameter, the name of the column to reference. This method returns a TField object if the column name exists or an error if the column name does not exists. This TField object can be used to update the data for that column in the row buffer via properties such as AsString, AsInteger, etc.

The following example shows how to use the Append method to add a row to a table with the following structure:

```
Column #    Name              DataType     Size
-------------------------------------------
1          CustomerID        ftString     10
2          CustomerName      ftString     30
3          ContactName       ftString     30
4          Phone             ftString     10
5          Fax               ftString     10
6          EMail             ftString     30
7          LastSaleDate      ftDate       0
8          Notes             ftMemo       0

Index Name      Columns In Index      Options
-------------------------------------------
```

```
Primary_Key     CustomerID          ixPrimary
```

```
begin
   with MyEDBDataSet do
      begin
      Append;  { State property will now reflect dsInsert }
      FieldByName('CustomerID').AsString:='100';
      FieldByName('CustomerName').AsString:='The Hardware Store';
      FieldByName('ContactName').AsString:='Bob Smith';
      FieldByName('Phone').AsString:='5551212';
      FieldByName('Fax').AsString:='5551616';
      FieldByName('Email').AsString:='bobs@thehardwarestore.com';
      Post;  { State property will now return to dsBrowse }
      end;
end;
```

If the row that is being posted violates a table constraint for the dataset then an EEDBError exception will be raised with the error code 1004 (EDB_ERROR_CONSTRAINT). Please see the Exception Handling and Errors and Appendix A - Error Codes and Messages topics for general information on exception handling in ElevateDB.

You may use the OnPostError event to trap for any of these error conditions and display a message to the user. You can also use a try..except block to do the same, and the approach is very similar. The following shows how to use an OnPostError event handler to trap for a constraint error:

```
procedure TMyForm.MyTablePostError(DataSet: TDataSet;
   E: EDatabaseError; var Action: TDataAction);
begin
   Action:=daAbort;
   if (E is EEDBError) then
      begin
      if (EEDBError(E).ErrorCode=EDB_ERROR_CONSTRAINT) then
         ShowMessage('This row violates a table or column constraint ('+
                     E.Message+')')
      else
         ShowMessage(E.Message);
      end
   else
      ShowMessage(E.Message);
end;
```

Note
You will notice that the OnPostError event handler uses the more general EDatabaseError exception object for it's exception (E) parameter. Because of this, you must always first determine whether the exception object being passed is actually an EEDBError before casting the exception object and trying to access specific properties such as the ErrorCode property. The EEDBError object descends from the EDatabaseError object.

The following shows how to use a try..except block to trap for a constraint error:

```
begin
   try
      with MyEDBDataSet do
         begin
         Append;  { State property will now reflect dsInsert }
         FieldByName('CustomerID').AsString:='100';
         FieldByName('CustomerName').AsString:='The Hardware Store';
         FieldByName('ContactName').AsString:='Bob Smith';
         FieldByName('Phone').AsString:='5551212';
         FieldByName('Fax').AsString:='5551616';
         FieldByName('Email').AsString:='bobs@thehardwarestore.com';
         Post;  { State property will now return to dsBrowse }
         end;
   except
      on E: Exception do
         begin
         if (E is EEDBError) then
            begin
            if (EEDBError(E).ErrorCode=EDB_ERROR_CONSTRAINT) then
               ShowMessage('This row violates a table or column constraint
      ('+
                           E.Message+')')
            else
               ShowMessage(E.Message);
            end
         else
            ShowMessage(E.Message);
         end;
   end;
end;
```

Editing an Existing Row

The Edit method allows you to begin the process of editing an existing row in the dataset. ElevateDB offers the choice of a pessimistic or optimistic locking protocol, which is configurable via the RecordLockProtocol property for the TEDBSession assigned to the current dataset (see the SessionName property for more information on setting the session for a dataset). With the pessimistic locking protocol a row lock is obtained when the Edit method is called. As long as the row is being edited ElevateDB will hold a row lock on that row, and will not release this lock until either the Post or Cancel methods is called. With the optimistic locking protocol a row lock is not obtained until the Post method is called, and never obtained if the Cancel method is called. This means that another user or session is capable of editing the row and posting the changes to the row before the Post method is called, thus potentially causing an EEDBError exception to be raised with the error code 1007 (EDB_ERROR_ROWDELETED), or even error code 1008 (EDB_ERROR_ROWMODIFIED) if row change detection is turned on for the current session via the TEDBSession RecordChangeDetection property. In such cases you must discard the edited row by calling the Cancel method and begin again with a fresh copy of the row using the Edit method.

Note
Any updates to the row are done via a row buffer and do not actually exist in the actual dataset until the row is posted using the Post method. If the Cancel method is called, then any updates to the row will be discarded. Also, once the row is posted using the Post method it will be positioned in the dataset according to the active index order based upon any changes made to the row. What this means is that if any column that is part of the current active index is changed, then it is possible for the row to re-position itself in a completely different place in the dataset after the Post method is called.

The following example shows how to use the Edit method to update a row in a dataset:

```
begin
   with MyEDBDataSet do
      begin
      Edit;  { State property will now reflect dsEdit }
      { Set LastSaleDate column to today's date }
      FieldByName('LastSaleDate').AsDateTime:=Date;
      Post;  { State property will now return to dsBrowse }
      end;
end;
```

If the row that you are attempting to edit (or post, if using the optimistic locking protocol) is already locked by another session, then an EEDBError exception will be raised with the error code 1005 (EDB_ERROR_LOCKROW).

It is also possible that the row that you are attempting to edit (or post) has been deleted by another session since it was last cached by ElevateDB. If this is the case then a ElevateDB exception will be raised with the error code 1007 (EDB_ERROR_ROWDELETED). If row change detection is enabled, then it is also possible that the row that you are attempting to edit (or post) has been changed by another session since it was last cached by ElevateDB. If this is the case then a ElevateDB exception will be raised with the error code 1008 (EDB_ERROR_ROWMODIFIED).

You may use the OnEditError (or OnPostError, depending upon the locking protocol) event to trap for these error conditions and display a message to the user. You can also use a try..except block to do the same, and the approach is very similar. The following shows how to use an OnEditError event handler to trap for several errors:

```
procedure TMyForm.MyTableEditError(DataSet: TDataSet;
   E: EDatabaseError; var Action: TDataAction);
begin
   Action:=daAbort;
   if (E is EEDBError) then
      begin
      if (EEDBError(E).ErrorCode=EDB_ERROR_LOCKROW) then
         begin
         if MessageDlg('The row you are trying to edit '+
                       'is currently locked, do you want to '+
                       'try to edit this row again?',
                        mtWarning,[mbYes,mbNo],0)=mrYes then
            Action:=daRetry;
         end
      else if (EEDBError(E).ErrorCode=EDB_ERROR_ROWDELETED) then
```

```
         begin
         MessageDlg('The row you are trying to edit '+
                    'has been deleted since it was last '+
                    'retrieved',mtError,[mbOk],0);
         DataSet.Refresh;
         end
      else if (EEDBError(E).ErrorCode=EDB_ERROR_ROWMODIFIED) then
         begin
         MessageDlg('The row you are trying to edit '+
                    'has been modified since it was last '+
                    'retrieved, the row will now be '+
                    'refreshed',mtWarning,[mbOk],0);
         DataSet.Refresh;
         Action:=daRetry;
         end
      else
         MessageDlg(E.Message,mtError,[mbOK],0);
      end
   else
      MessageDlg(E.Message,mtError,[mbOK],0);
end;
```

The following shows how to use a try..except block to trap for several errors:

```
begin
   while True do
      begin
      try
         with MyEDBDataSet do
            begin
            Edit;  { State property will now reflect dsEdit }
            { Set LastSaleDate column to today's date }
            FieldByName('LastSaleDate').AsDateTime:=Date;
            Post;  { State property will now return to dsBrowse }
            end;
         Break; { Break out of retry loop }
      except
         on E: Exception do
            begin
            if (E is EEDBError) then
               begin
               if (EEDBError(E).ErrorCode=EDB_ERROR_LOCKROW) then
                  begin
                  if MessageDlg('The row you are trying '+
                                'to edit is currently locked, '+
                                'do you want to try to edit '+
                                'this row again?,mtWarning,
                                [mbYes,mbNo],0)=mrYes then
                     Continue;
                  end
               else if (EEDBError(E).ErrorCode=EDB_ERROR_ROWDELETED) then
                  begin
                  MessageDlg('The row you are trying '+
                             'to edit has been deleted '+
                             'since it was last retrieved',
                             mtError,[mbOk],0);
                  MyTable.Refresh;
```

```
                  Break;
                  end
               else if (EEDBError(E).ErrorCode=EDB_ERROR_ROWMODIFIED) then
                  begin
                  MessageDlg('The row you are trying '+
                             'to edit has been modified '+
                             'since it was last retrieved, '+
                             'the row will now be '+
                             'refreshed',mtWarning,[mbOk],0);
                  MyTable.Refresh;
                  Continue;
                  end
               else
                  begin
                  MessageDlg(E.Message,mtError,[mbOK],0);
                  Break;
                  end;
                end
            else
               begin
               MessageDlg(E.Message,mtError,[mbOK],0);
               Break;
               end;
            end;
      end;
      end;
end;
```

Deleting an Existing Row

The Delete method allows you to delete an existing row in a dataset. Unlike the Append, Insert, and Edit methods, the Delete method is a one-step process and does not require a call to the Post method to complete its operation. A row lock is obtained when the Delete method is called and is released as soon as the method completes. After the row is deleted the current position in the dataset will be the next closest row based upon the active index order.

The following example shows how to use the Delete method to delete a row in a dataset:

```
begin
   with MyEDBDataSet do
      Delete;
end;
```

If the row that you are attempting to delete is already locked by another user or session, then an EEDBError exception will be raised with the error code 1005 (EDB_ERROR_LOCKROW).

It is also possible that the row that you are attempting to delete has been deleted by another session since it was last cached by ElevateDB. If this is the case then a ElevateDB exception will be raised with the error code 1007 (EDB_ERROR_ROWDELETED). If row change detection is enabled, then it is also possible that the row that you are attempting to delete has been changed by another session since it was last cached by ElevateDB. If this is the case then a ElevateDB exception will be raised with the error code 1008 (EDB_ERROR_ROWMODIFIED).

You may use the OnDeleteError event to trap for these error conditions and display a message to the user.

You can also use a try..except block to do the same, and the approach is very similar. The code for an handling Delete errors is the same as that of an Edit, so please refer to the above code samples for handling Edit errors.

Cancelling an Insert/Append or Edit Operation

You may cancel an existing Insert/Append or Edit operation by calling the Cancel method. Doing this will discard any updates to an existing row if you are editing, or will completely discard a new row if you are inserting or appending. The following example shows how to cancel an edit operation on an existing row:

```
begin
   with MyEDBDataSet do
      begin
      Edit;  { State property will now reflect dsEdit }
      { Set LastSaleDate column to today's date }
      FieldByName('LastSaleDate').AsDateTime:=Date;
      Cancel;  { State property will now return to dsBrowse }
      end;
end;
```

Additional Events

There are several additional events that can be used to hook into the updating process for a dataset. They include the BeforeInsert, AfterInsert, OnNewRow, BeforeEdit, AfterEdit, BeforeDelete, AfterDelete, BeforePost, AfterPost, BeforeCancel, and AfterCancel events. All of these events are fairly self-explanatory, however the OnNewRow is special in that it can be used to assign values to columns in a newly-inserted or appended row without having the dataset mark the row as modified. If a row has not been modified in any manner, then the dataset will not perform an implicit Post operation when navigating off of the row. Instead, the Cancel method will be called and the row discarded.

Updating BLOB and CLOB Columns

Most of the time you can simply use the general TField AsString and AsVariant properties to update a BLOB or CLOB column in the same fashion as you would any other column. Both of these properties allow very large strings or binary data to be stored in a BLOB or CLOB column. However, in certain cases you may want to take advantage of additional methods and functionality that are available through the TBlobField object that descends from TField or the TEDBBlobStream object that provides a stream interface to a BLOB or CLOB column. The most interesting methods of the TBlobField object are the LoadFromFile, LoadFromStream, SaveToFile, and SaveToStream methods. These methods allow you to very easily load and save the data to and from BLOB and CLOB columns.

Note
You must make sure that the dataset's State property is either dsInsert or dsEdit before using the LoadFromFile or LoadFromStream methods.

The following is an example of using the LoadFromFile method of the TBlobField object to load the contents of a text file into a CLOB column:

```
begin
```

```
   with MyEDBDataSet do
      begin
      Edit;  { State property will now reflect dsEdit }
      { Load a text file from disk }
      TBlobField(FieldByName('Notes')).LoadFromFile('c:\temp\test.txt');
      Post;  { State property will now return to dsBrowse }
      end;
end;
```

Note
You'll notice that we must cast the result of the FieldByName method, which returns a TField object reference, to a TBlobField type in order to allow us to call the LoadFromFile method. This is okay since a CLOB column uses a TMemoField object, which descends directly from TBlobField, which itself descends directly from TField.

In addition to these very useful methods, you can also directly manipulate a BLOB or CLOB column like any other stream by using the TEDBBlobStream object. The following is an example of using a TEDBBlobStream component along with the TEDBTable or TEDBQuery SaveToStream method for storing ElevateDB tables themselves in the BLOB column of another table:

```
var
   BlobStream: TEDBBlobStream;
begin
   { First create the BLOB stream - be sure to make sure that
     we put the table into dsEdit or dsInsert mode first since
     we're writing to the BLOB stream }
   FirstEDBDataSet.Append;
   try
      BlobStream:=TEDBBlobStream.Create(TBlobField(
          FirstEDBDataSet.FieldByName('TableStream')),bmWrite);
      try
         { Now save the table to the BLOB stream }
         SecondEDBDataSet.SaveToStream(BlobStream);
      finally
         { Be sure to free the BLOB stream *before* the Post }
         BlobStream.Free;
      end;
      FirstEDBDataSet.Post;
   except
      { Cancel on an exception }
      FirstEDBDataSet.Cancel;
   end;
end;
```

Note
For proper results when updating a BLOB or CLOB column using a TEDBBlobStream object, you must create the TEDBBlobStream object after calling the Append/Insert or Edit methods for the dataset containing the BLOB or CLOB column. Also, you must free the TEDBBlobStream object before calling the Post method to post the changes to the dataset. Finally, be sure to use the proper open mode when creating a TEDBBlobStream object for updating (either bmReadWrite or bmWrite).

5.21 Searching and Sorting Tables, Views, and Query Result Sets

Searching and sorting tables, views, and query result sets is accomplished through several methods of the TEDBTable, TEDBQuery, TEDBScript, and TEDBStoredProc components. The basic searching methods for tables (not views or query result sets) include the FindKey, FindNearest, SetKey, EditKey, GotoKey, and GotoNearest methods. The KeyColumnCount property is used with the SetKey and EditKey methods to control searching using the GotoKey and GotoNearest methods. The extended searching methods that do not necessarily rely upon an index and can be used with both tables and query result sets include the Locate, FindFirst, FindLast, FindNext, and FindPrior methods. The basic sorting methods for tables include the IndexName and IndexFieldNames properties.

Changing the Sort Order

You may use the TEDBTable IndexName and IndexFieldNames properties to set the current index order, and in effect, sort the current table based upon the index definition for the selected index order.

The IndexName property is used to set the name of the current index. This property should be set to the name of the index that you wish to use as the current index order. Setting the IndexName property to blank (') will cause the index order to reset to the default order for the table, which is usually the order defined by the primary key of the table, or the natural insertion order of the table if the table does not have a primary key defined. The following example shows how you would set the current index order for a table to an index called "CustomerName":

```
begin
   with MyTable do
      begin
      IndexName:='CustomerName';
      { do something }
      end;
end;
```

Note
Changing the index order can cause the current row pointer to move to a different position in the table (but not necessarily move off of the current row unless the row has been changed or deleted by another session). Call the First method after setting the IndexName property if you want to have the row pointer set to the beginning of the table based upon the next index order. Changing the index order will also remove any ranges that are active.

If you attempt to set the IndexName property to a non-existent index an EEDBError exception will be raised with the error code 401 (EDB_ERROR_NOTFOUND).

The IndexFieldNames property is used to set the current index order by specifying the column names of the desired index instead of the index name. Multiple column names should be separated with a semicolon. Using the IndexFieldNames property is desirable in cases where you are trying to set the current index order based upon a known set of columns and do not have any knowledge of the index names available. The IndexFieldNames property will attempt to match the given number of columns with the same number of beginning columns, in left-to-right order, in any of the available indexes for the table. The following example shows how you would set the current index order to an index called "CustomerName" that consists of the CustomerName column and the CustomerNo column:

```
begin
   with MyTable do
      begin
      IndexFieldNames:='CustomerName;CustomerNo';
      { do something }
      end;
end;
```

Note
Setting the IndexFieldNames will not work on indexes that contain descending columns or contain columns using case-insensitive collations, so you must use the IndexName property instead. Please see the Internationalization topic for information on collations and index columns.

If ElevateDB cannot find any indexes that match the desired column names an EDatabaseError exception will be raised instead of an EEDBError exception. If you are using this method of setting the current index order you should also be prepared to trap for this exception and deal with it appropriately.

Searching Using an Index

The TEDBTable FindKey method accepts an array of search values to use in order to perform an exact search for a given row using the active index. The return value of the FindKey method indicates whether the search was successful. If the search was successful then the row pointer is moved to the desired row, whereas if the search was not successful then the row pointer stays at its current position. The search values must correspond to the columns that make up the active index or the search will not work properly. However, FindKey does not require that you fill in all of the column values for all of the columns in the active index, rather only that you fill in the column values from left to right. The following example shows how to perform a search on the index used to enforce the primary key and comprised of the CustomerNo column:

```
begin
   with MyTable do
      begin
      { Set to the natural order, which in this case
        is the primary key }
      IndexName:='';
      { Search for customer 100 }
      if FindKey([100]) then
         { Row was found, now do something }
      else
         ShowMessage('Row was not found');
      end;
end;
```

The FindNearest method accepts an array of search values to use in order to perform a near search for a given row using the active index. If the search was successful then the row pointer is moved to the desired row, whereas if the search was not successful then the row pointer is moved to the next row that most closely matches the current search values. If there are no rows that are greater than the search values then the row pointer will be positioned at the end of the table. The search values must correspond to the columns that make up the active index or the search will not work properly. However, FindNearest

does not require that you fill in all of the column values for all of the columns in the active index, rather only that you fill in the column values from left to right. The following example shows how to perform a near search on the index used to enforce the primary key and comprised of the CustomerNo column:

```
begin
   with MyTable do
      begin
      { Set to the natural order, which in this case
        is the primary key }
      IndexName:='';
      { Search for customer 100 or closest }
      FindNearest([100]);
      end;
end;
```

The SetKey and EditKey methods are used in conjunction with the GotoKey and GotoNearest methods to perform searching using column assignments instead of an array of column values. The SetKey method begins the search process by putting the TEDBTable component into the dsSetKey state and clearing all column values. You can examine the state of the table using the State property. The application must then assign values to the desired columns and call the GotoKey or GotoNearest method to perform the actual search. The GotoNearest method may be used if you wish to perform a near search instead of an exact search. The EditKey method extends or continues the current search process by putting the TEDBTable component into the dsSetKey state but not clearing any column values. This allows you to change only one column without being forced to re-enter all column values needed for the search. The KeyColumnCount property controls how many columns, based upon the current index, are to be used in the actual search. By default the KeyColumnCount property is set to the number of columns for the active index. The following example shows how to perform an exact search using the SetKey and GotoKey methods and KeyColumnCount property. The active index is an index called "CustomerName" comprised of the CustomerName column and the CustomerNo column:

```
begin
   with MyTable do
      begin
      { Set to the CustomerName index }
      IndexName:='CustomerName';
      { Search for the customer with the
        name 'The Hardware Store' }
      SetKey;
      ColumnByName('CustomerName').AsString:='The Hardware Store';
      { This causes the search to only look at the first column
        in the current index when searching }
      KeyColumnCount:=1;
      if GotoKey then
         { Row was found, now do something }
      else
         ShowMessage('Row was not found');
      end;
end;
```

Note
In the previous example we executed a partial-column search. What this means is that we did not include all of the columns in the active index. ElevateDB does not require that you use all of the columns in the active index for searching.

The following example shows how to perform a near search using the SetKey and GotoNearest methods, and KeyColumnCount property. The active index is an index called "CustomerName" comprised of the CustomerName column and the CustomerNo column:

```
begin
   with MyTable do
      begin
      { Set to the CustomerName index }
      IndexName:='CustomerName';
      { Search for the customer with the
        name 'The Hardware Store' }
      SetKey;
      ColumnByName('CustomerName').AsString:='The Hardware Store';
      { This causes the search to only look at the first column
        in the current index when searching }
      KeyColumnCount:=1;
      GotoNearest;
      end;
end;
```

Searching Without a Specific Index Order Set

The Locate method of the TEDBTable, TEDBQuery, and TEDBStoredProc components is used to locate a row independent of the active index order or of any indexes at all. This is why it can be used with query result sets in addition to tables. The Locate method will attempt to use the active index for searching, but if the current search columns do not match the active index then the Locate method will attempt to use another available index. Indexes are selected based upon the options passed to the Locate method in conjunction with the column names that you wish to search upon. The index columns are checked from left to right, and if an index is found that matches the search columns from left to right and satisfies the options desired for the search it will be used to perform the search. Finally, if no indexes can be found that can be used for the search, a table scan will be used to execute the search instead. This is usually a sub-optimal solution and can take a bit of time since the table scan will read every row in the table in order to examine the desired column values. The Locate method uses the following criteria when determining whether to use an index or not for the search:

1) ElevateDB matches the index columns to the search columns in left-to-right order.

2) ElevateDB can use an index for the search irrespective of the ascending or descending status of a given column in the index.

3) ElevateDB can only use an index for the search if the first column(s) in the index in left-to-right order match(es) both the column(s) being searched upon and the setting of the loCaseInsensitive flag in the Locate options. If the loCaseInsensitive flag is not specified, then the index column in the index (being examined for possible use in the search) must be assigned a case-sensitive collation. If the loCaseInsensitive flag is specified, then the index column in the index must be assigned a case-insensitive collation.

For example, suppose that you have a Customer table with a State column that was defined with the ANSI_CI (ANSI collation, case-insensitive). An index was created on the State column using the following CREATE INDEX statement:

```
CREATE INDEX State ON Customer (State)
```

To execute an optimized search for any rows where the State column contains 'FL', one would use the following code:

```
begin
   with MyTable do
      begin
      { Search for the customer with the
        state "FL" }
      if Locate('State',['FL'],[loCaseInsensitive]) then
         { Row was found, now do something }
      else
         ShowMessage('Row was not found');
      end;
end;
```

However, suppose that the State column was defined with simply the ANSI collation (case-sensitive) and the index was created using the following CREATE INDEX statement:

```
CREATE INDEX State ON Customer
(State)
```

In order to allow ElevateDB to use this index to optimize any searches on the State column, you must now not include the loCaseInsensitive flag:

```
begin
   with MyTable do
      begin
      { Search for the customer with the
        state "FL" }
      if Locate('State',['FL'],[]) then
         { Row was found, now do something }
      else
         ShowMessage('Row was not found');
      end;
end;
```

Please see the Internationalization topic for more information on collations.

The FindFirst, FindLast, FindNext, and FindPrior methods all rely on the Filter and FilterOptions properties to do their work. These methods are the most flexible for searching and can be used with both tables and query result sets, but there are some important caveats. To get acceptable performance from these methods you must make sure that the filter expression being used for the Filter property is optimized or at

least partially-optimized. If the filter expression is un-optimized it will take a significantly greater amount of time to complete every call to any of the FindFirst, FindLast, FindNext, or FindPrior methods unless the table or query result set being searched only has a small number of rows. Please see the Setting Filters on Tables and Query Result Sets topic for more information. Also, because the Filter property is being used for these methods, you cannot use a different filter expression in combination with these methods. However, you can set the Filtered property to True and show only the filtered rows if you so desire. Finally, the FilterOptions property controls how the filtering is performed during the searching, so you should make sure that these options are set properly. The following example shows how to use the Filter property and FindFirst and FindNext methods to find matching rows and navigate through them in a table:

```
begin
   with MyTable do
      begin
      { Search for the first customer with the
        name "The Hardware Store" }
      Filter:='CustomerName='+QuotedStr('The Hardware Store');
      { We want the search to be case-insensitive }
      FilterOptions:=[foCaseInsensitive];
      if FindFirst then
         begin
         { Row was found, now search through
           the rest of the matching rows }
         while FindNext do
            { Do something here }
         end
      else
         ShowMessage('Row was not found');
      end;
end;
```

5.22 Setting Ranges on Tables

Setting ranges on tables is accomplished through several methods of the TEDBTable component. The basic range methods include the SetRange, SetRangeStart, SetRangeEnd, EditRangeStart, EditRangeEnd, and ApplyRange methods. The KeyColumnCount property is used with the SetRangeStart, SetRangeEnd, EditRangeStart and EditRangeEnd methods to control searching using the ApplyRange method. All range operations are dependent upon the active index order set using the IndexName or IndexFieldNames properties. Ranges may be combined with expression filters set using the Filter and Filtered propertes and/or code-based filters set using the OnFilterRow event to further filter the rows in the table.

Setting a Range

The SetRange method accepts two arrays of values to use in order to set a range on a given table. If the current row pointer does not fall into the range values specified, then the current row pointer will be moved to the nearest row that falls within the range. These value arrays must contain the column values in the same order as the column names in the active index or the range will not return the desired results. However, SetRange does not require that you fill in all of the column values for all of the columns in the active index, rather only that you fill in the column values from left to right. The following example shows how to perform a range on the index used to enforce the primary key and comprised of the CustomerNo column:

```
begin
   with MyTable do
      begin
      { Set to the natural order, which in this case
        is the primary key }
      IndexName:='';
      { Set a range from customer 100 to customer 300 }
      SetRange([100],[300]);
      end;
end;
```

The SetRangeStart, SetRangeEnd, EditRangeStart, and EditRangeEnd methods are used in conjunction with the ApplyRange method to perform a range using column assignments instead of arrays of column values. The SetRangeStart method begins the range process by putting the TEDBTable component into the dsSetKey state and clearing all column values. You can examine the state of the table using the State property. The application must then assign values to the desired columns for the start of the range and then proceed to call SetRangeEnd to assign values to the desired columns for the end of the range. After this is done the application can call the ApplyRange method to perform the actual range operation. The EditRangeStart and EditRangeEnd methods extend or continue the current range process by putting the TEDBTable component into the dsSetKey state but not clearing any column values. You can examine the state of the table using the State property. This allows you to change only one column without being forced to re-enter all column values needed for the beginning or ending values of the range. The KeyColumnCount property controls how many columns, based upon the active index, are to be used in the actual range and can be set independently for both the starting and ending column values of the range. By default the KeyColumnCount property is set to the number of columns in the active index. The following example shows how to perform a range using the SetRangeStart, SetRangeEnd, and ApplyRange methods and KeyColumnCount property. The active index is an index called "CustomerName" that consists of the CustomerName column and the CustomerNo column:

```
begin
```

```
   with MyTable do
      begin
      { Set to the CustomerName index }
      IndexName:='CustomerName';
      { Set a range to find all customers with
        a name beginning with 'A' }
      SetRangeStart;
      ColumnByName('CustomerName').AsString:='A';
      { This causes the range to only look at
        the first column in the current index }
      KeyColumnCount:=1;
      SetRangeEnd;
      { Note the padding of the ending range
        values with lowercase z's
        to the length of the CustomerName
        column, which is 20 characters }
      ColumnByName('CustomerName').AsString:='Azzzzzzzzzzzzzzzzzz';
      { This causes the range to only look at
        the first column in the current index }
      KeyColumnCount:=1;
      ApplyRange;
      end;
end;
```

Note
In the previous example we executed a partial-column range. What this means is that we did not include all of the columns in the active index in the range. ElevateDB does not require that you use all of the columns in the active index for the range.

5.23 Setting Master-Detail Links on Tables

A master-detail link is a property-based linkage between a master TDataSource component and a detail TEDBTable component. Once a master-detail link is established, any changes to the master TDataSource component will cause the detail TEDBTable component to automatically reflect the change and show only the detail rows that match the current master row based upon the link criteria. Master-detail links use ranges for their functionality, and therefore are dependent upon the active index in the detail table. Like ranges, master-detail links may be combined with expression filters set using the Filter and Filtered propertes and/or code-based filters set using the OnFilterRow event to further filter the rows in the detail table.

Defining the Link Properties

Setting master-detail links on tables is accomplished through four properties in the detail TEDBTable component. These properties are the MasterSource, MasterColumns, IndexName, and IndexFieldNames properties.

The first step in setting a master-detail link is to assign the MasterSource property. The MasterSource property refers to a TDataSource component. This makes master-detail links very flexible, because the TDataSource component can provide data from any TDataSet-descendant component such as a TEDBTable or TEDBQuery component as well as many other non-ElevateDB dataset components.

> **Note**
> For the link to be valid, the TDataSource DataSet property must refer to a valid TDataSet-descendant component.

The next step is to assign the IndexName property, or IndexFieldNames property, so that the active index, and the columns that make up that index, will match the columns that you wish to use for the link. The only difference between specifying the IndexName property versus the IndexFieldNames property is that the IndexName property expects the name of an index, whereas the IndexFieldNames only expects the names of columns in the table that match the columns found in an index in the table from left-to-right. The IndexFieldNames property also does not require that all of the columns in an existing index be specified in order to match with that existing index, only enough to be able to select the index so that it will satisfy the needs of the master-detail link.

Finally, the MasterColumns property must be assigned a value. This property requires a column or list of columns separated by semicolons from the master data source that match the columns in the active index for the detail table.

To illustrate all of this we'll use an example. Let's suppose that we have two tables with the following structure and we wish to link them via a master-detail link:

```
Customer Table

Column #    Name              DataType     Size
-----------------------------------------------
1          CustomerID        ftString     10
2          CustomerName      ftString     30
3          ContactName       ftString     30
4          Phone             ftString     10
5          Fax               ftString     10
```

```
6          EMail             ftString     30
```

Note
Indexes in this case are not important since this will be the master table

```
Orders Table

Column #    Name              DataType     Size
-----------------------------------------------
1          CustomerID        ftString     10
2          OrderNumber       ftString     10
3          OrderDate         ftDate       0
4          OrderAmount       ftBCD        2

Index Name      Columns In Index             Options
-----------------------------------------------------
Primary_Key     CustomerID;OrderNumber      ixPrimary
```

We would use the following example code to establish a master-detail link between the two tables. In this example it is assumed that a TDataSource component called CustomerSource exists and points to a TEDBTable component for the "customer" table:

```
begin
   with OrdersTable do
      begin
      { Set to the natural order, which in this case
        is the primary key }
      IndexName:='';
      { Assign the MasterSource property }
      MasterSource:=CustomerSource;
      { Set the MasterColumns property to point to the
        CustomerID column from the Customer table }
      MasterColumns:='CustomerID';
      end;
end;
```

Now any time the current row in the CustomerSource data source changes in any way, the OrdersTable will automatically reflect that change and only show rows that match the master row's CustomerID column. Below is the same example, but changed to use the IndexFieldNames property instead:

```
begin
   with OrdersTable do
      begin
      { Set to the CustomerID column }
      IndexFieldNames:='CustomerID';
      { Assign the MasterSource property }
      MasterSource:=CustomerSource;
      { Set the MasterColumns property to point to the
        CustomerID column from the Customer table }
```

```
      MasterColumns:='CustomerID';
      end;
end;
```

Note
Because a master-detail link uses data-event notification in the TDataSource component for maintaining the link, if the TDataSet component referred to by the TDataSource component's DataSet property calls its DisableControls method, it will not only disable the updating of any data-aware controls that refer to it, but it will also disable any master-detail links that refer to it also. This is the way the TDataSet and TDataSource components have been designed, so this is an expected behavior that you should keep in mind when designing your application.

5.24 Setting Filters on Tables, Views, and Query Result Sets

Setting filters on tables, views, and query result sets is accomplished through several properties of the TEDBTable, TEDBQuery, TEDBScript, and TEDBStoredProc components. These properties include the Filter, FilterOptions, and Filtered properties. The OnFilterRow event is used to assign a code-based filter event handler that can be used to filter rows using Delphi, C++Builder, or Lazarus code. All filter operations are completely independent of any active index order.

Setting an Expression Filter

The Filter, FilterOptions, Filtered, and FilterOptimizeLevel properties are used to set an expression filter. The steps to set an expression filter include setting the filter expression using the Filter property, specifying any filter options using the FilterOptions property, and then making the expression filter active by setting the Filtered property to True. You can turn off or disable an expression filter by setting the Filtered property to False. If the current row pointer does not fall into the conditions specified by an expression filter, then the current row pointer will be moved to the nearest row that falls within the filtered set of rows. Expression filters may be combined with ranges, master-detail links, and/or code-based filters to further filter the rows in the table or query result set.

ElevateDB's expression filters use the same naming conventions, operators, and functions as its SQL implementation of WHERE conditions. The only differences are as follows:

Difference	Description
Correlation Names	You cannot use table or column correlation names in filter expressions.
Query expressions	You cannot use query expressions in filter expressions.
Wildcards	You can additionally use the asterisk (*) wildcard character with the equality operator (=) or inequality operator (<>) in order to perform partial-length comparisons. However, this only works when the foNoPartialCompare element is not included in the FilterOptions property.

Please see the Identifiers, Types and Operators, Numeric Functions, String Functions, Date/Time Functions, Interval Functions, and Conversion Functions topics for more information.

The following example shows how to set an expression filter where the LastSaleDate column is between January 1, 1998 and December 31, 1998 and the TotalSales column is greater than 10,000 dollars:

```
begin
   with MyTable do
      begin
      { Set the filter expression  }
      Filter:='(LastSaleDate >= DATE '+Engine.QuotedSQLStr('1998-01-01')+')
      '+
              'and (LastSaleDate <= DATE
      '+Engine.QuotedSQLStr('1998-12-31')+') '+
              'and (TotalSales > 10000)';
      FilterOptions:=[];
      Filtered:=True;
      end;
end;
```

ElevateDB attempts to optimize all expression filters, and the filter optimization process is the same as that used for optimizing SQL WHERE conditions. Please see the Optimizer topic for more information.

Setting a Code-Based Filter

The OnFilterRow event and the Filtered property are used together to set a code-based filter. The steps to set a code-based filter include assigning an event handler to the OnFilterRow event and then making the code-based filter active by setting the Filtered property to True. You can turn off or disable a code-based filter by setting the Filtered property to False. If the current row pointer does not fall into the conditions specified within the code-based filter, then the current row pointer will be moved to the nearest row that falls within the filtered set of rows.

The following example shows how to write a code-based filter event handler where the CustomerName column contains the word "Hardware" (case-sensitive):

```
procedure TMyForm.TableFilterRow(DataSet: TDataSet;
   var Accept: Boolean);
begin
   Accept:=False;
   if Pos('Hardware',
          DataSet.ColumnByName('CustomerName').AsString) > 0) then
      Accept:=True;
end;
```

Code-based filters implemented via an OnFilterRow event handler are always completely un-optimized. However, ElevateDB only incrementally calls the OnFilterRow event handler for the row or rows necessary for any data-aware controls or for positioning on a desired row (if data-aware controls are not being used). For example, if you positioned a table with an active code-based filter on a new row using the Locate method, then ElevateDB will call the OnFilterRow event handler for the current row and any subsequent rows using the active index order until it has found a row that satisfies the event handler (Accept=True). ElevateDB then stops and does not attempt to filter any further rows. The OnFilterRow event handler can, therefore, be used to filter large numbers of rows incrementally without a large amount of overhead.

5.25 Using Streams with Tables, Views and Query Result Sets

Loading and saving tables, views, and query result sets to and from streams is accomplished through the LoadFromStream and SaveToStream methods of the TEDBTable, TEDBQuery, TEDBScript, and TEDBStoredProc components. A stream is any TStream-descendant object such as TFileStream, TMemoryStream, or even the ElevateDB TEDBBlobStream object used for reading and writing to BLOB columns. Loading a stream copies the entire contents of a stream to an existing table, view, or query result set. When loading a stream, the contents of the stream must have been created using the SaveToStream method or else an EEDBError exception will be raised. The error code given when a load from a stream fails because of an invalid stream is 1003 (EDB_ERROR_STREAM). Saving to a stream copies the contents of a table, view, or query result set to the stream, overwriting the entire contents of the stream. The rows that are copied can be controlled by setting a range or filter on the source table or query result set prior to calling the SaveToStream method. Please see the Setting Ranges on Tables and Setting Filters on Tables and Query Result Sets topics for more information.

Loading Data from a Stream

To load data from a stream into an existing table, view, or query result set, you must open the TEDBTable, TEDBQuery, or TEDBStoredProc component and then call the LoadFromStream method.

The following example shows how to load data from a memory stream (assumed to already be created) into a table using the LoadFromStream method:

```
begin
   with MyTable do
      begin
      DatabaseName:='SalesDB';
      TableName:='customer';
      Open;
      LoadFromStream(MyMemoryStream);
      end;
end;
```

Note
Tables, views, or query result sets in remote sessions can load data from a local (client-side) stream. However, since the stream contents are sent as one buffer to the ElevateDB Server as part of the load request, it is recommended that you do not load particularly large streams since you will run the risk of exceeding the available memory on the local workstation or ElevateDB Server.

Saving Data to a Stream

To save the data from a table, view, or query result set to a stream, you must open the TEDBTable, TEDBQuery, or TEDBStoredProc component and then call the SaveToStream method.

The following example shows how to save the data from a table to a memory stream (assumed to already be created) using the SaveToStream method of the TEDBTable component:

```
begin
```

```
   with MyTable do
      begin
      DatabaseName:='SalesDB';
      TableName:='customer';
      Open;
      SaveToStream(MyMemoryStream);
      end;
end;
```

Note
When the SaveToStream method is called, the existing position of the stream pointer in the destination stream is not moved, and the size of the destination stream is not changed except in the case where the size must be expanded to accomodate the new stream data being saved from the table, view, or query result set. Therefore, if you wish to overwrite any existing data in the destination stream during the SaveToStream method call, you should use the following code on the stream before calling the SaveToStream method:

```
begin
   with MyStream do
      begin
      Size:=0;
      Position:=0;
      end;
end;
```

The reason for this behavior is that it allows the developer the possibility of combining multiple streams from multiple tables, views, or query result sets into one stream.

5.26 Cached Updates

Using cached updates with tables, views, and query result sets is accomplished through the BeginCachedUpdates, and ApplyCachedUpdates, and CancelCachedUpdates methods of the TEDBTable, TEDBQuery, TEDBScript, and TEDBStoredProc components. In addition, the CachingUpdates property can be used to find out when cached updates are in effect for a dataset.

Using cached updates permits an application to copy all existing rows in a given table, view, or query result set to a temporary table that is then used for any inserts, updates, or deletes. Once all updates are complete, the application may then call the ApplyCachedUpdates method to apply all updates to the source table or query result set, or the CancelCachedUpdates method to cancel all updates and revert the table or query result set to its original state prior to the cached updates. The rows that are included in the cached updates can be controlled by setting a range or filter on the source table or query result set prior to calling the BeginCachedUpdates method. Please see the Setting Ranges on Tables and Setting Filters on Tables,Views, and Query Result Sets topics for more information.

Warning
Do not use cached updates on very large tables or query result sets with large number of rows in the active set according to any active ranges and/or filters. Doing so can result in some serious performance problems as the entire set of rows will need to be copied when cached updates are begun.

Beginning Cached Updates

To begin cached updates, you must call the BeginCachedUpdates method. When using either a TEDBTable, TEDBQuery, TEDBStoredProc, or TEDBScript component, the table, view, or query result set must be opened (Active property is set to True) or an exception will be raised.

Note
Cached updates require that a primary key be defined for the underlying table that is being updated or else an EEDBError exception will be raised. The error code given when a BeginCachedUpdates call fails due to a missing primary key is 1307 (EDB_ERROR_CACHEUPDATES).

Applying Cached Updates

To apply any cached updates to the source table, view, or query result set, you must call the ApplyCachedUpdates method. This method will apply any updates that were made to the temporary table used for the cached updates to the source table, view, or query result set. Only rows that were inserted, updated, or deleted are processed, so the result is the same as calling the CancelCachedUpdates method if no rows were inserted, updated, or deleted while cached updates were enabled. You can examine the CachingUpdates property to determine whether cached udpdates are in effect before trying to apply any cached updates.

A transaction is not required around the ApplyCachedUpdates method call in order to make it atomic. The ApplyCachedUpdates method is always executed as an atomic unit of work.

Reconciling Errors

Cached updates are handled in an optimistic manner, which means that ElevateDB does not hold any locks on the rows that are held in the cache while the cached updates are in effect. Subsequently, it is possible that another session has changed some or all of the rows that were cached and updated or deleted in the cache. When the cached updates are then applied using the ApplyCachedUpdates method, an error message will be raised and it is possible that only a portion of the cached updates will be applied to the source table, view, or query result set. To avoid this, you can define an ERROR trigger on the underlying table being updated. For more information on ERROR triggers, please see the CREATE TRIGGER topic in the ElevateDB SQL Manual.

Note
Calling the LOADINGUPDATES function during an ERROR trigger will return TRUE during the execution of the ApplyCachedUpdates call. This is because the cached updates functionality uses the ElevateDB replication manager for their implementation.

Filters, Ranges, and Master-Detail Links

Most of the operations that can be performed on a TEDBTable, TEDBQuery, TEDBScript, or TEDBStoredProc component behave the same regardless of whether cached updates are active or not. This includes the following operations:

Navigating Tables, Views, and Query Result Sets
Searching and Sorting Tables, Views, and Query Result Sets
Inserting, Updating, and Deleting Rows

However, certain states of the table, view, or query result set are not carried over to the cached updates temporary table. These include:

Filters
Ranges
Master-Detail Links

All of these states are reset for the cached updates temporary table. You may apply new filters, ranges, and/or master-detail links on the cached updates temporary table if you wish, but they will not apply to the base table nor will they affect the base table's state with respect to filters, ranges, or master-detail links. After the cached updates are applied or cancelled, all of these states are set back to what they were prior to the cached updates being active.

Refreshing During Cached Updates

If you call the TEDBTable, TEDBQuery, TEDBStoredProc, or TEDBScript Refresh method while cached updates are active, then the current contents of the cached updates temporary table will be discarded and replaced with the latest data from the base table. Cached updates will remain in effect after the Refresh is complete.

Chapter 6
Component Reference

6.1 EEDBError Component

Unit: edbcomps

Inherits From EDatabaseError

An EEDBError exception object is raised whenever an ElevateDB error occurs. You will find a list of all of the ElevateDB error codes in the Appendix A - Error Codes and Messages topic. For general information on exception handling in ElevateDB please see the Exception Handling and Errors topic.

Properties	Methods	Events
ErrorCode	Create	
ErrorColumn		
ErrorLine		
ErrorMsg		

EEDBError.ErrorCode Property

```
property ErrorCode: Integer
```

Indicates the native ElevateDB error code being raised in the current exception.

Note
This property is always set for every exception.

EEDBError.ErrorColumn Property

```
property ErrorColumn: Integer
```

Indicates the column of text in that the current exception applies to.

Note
This property may or may not be set depending upon the exception being raised.

EEDBError.ErrorLine Property

```
property ErrorLine: Integer
```

Indicates the line of text in that the current exception applies to.

Note
This property may or may not be set depending upon the exception being raised.

EEDBError.ErrorMsg Property

```
property ErrorMsg: String
```

Indicates the error message that gives further information on the exception.

Note
This property is always set for every exception.

EEDBError.Create Method

```
constructor Create(E: Exception)
```

Call the Create constructor to create an instance of the EEDBError exception class.

6.2 TEDBBlobStream Component

Unit: edbcomps

Inherits From TStream

Use the TEDBBlobStream object to access or modify the contents of a BLOB or CLOB column in a dataset using a stream interface. A BLOB column is represented by the TBlobField object, and a CLOB column is represented by a TMemoField object. TBlobField and TMemoField objects use streams to implement many of their data access properties and methods via the standard CreateBlobStream method that is implemented by the ElevateDB dataset components.

To use a TEDBBlobStream object, create an instance of TEDBBlobStream, use the methods of the TEDBBlobStream object to read or write the data, and then free the object. Do not use the same instance of a TEDBBlobStream object to access data from more than one row. Instead, create a new TEDBBlobStream object every time you need to read or write to a BLOB or CLOB column for a row.

Note
For proper results when updating a BLOB or CLOB column using a TEDBBlobStream object, you must create the TEDBBlobStream object after calling the Append/Insert or Edit method for the dataset containing the BLOB or CLOB column. Also, you must free the TEDBBlobStream object before calling the Post method to post the changes to the dataset. Finally, be sure to use the proper open mode when creating a TEDBBlobStream object for updating (either bmReadWrite or bmWrite).

Properties	Methods	Events
	Create	
	Read	
	Seek	
	Truncate	
	Write	

TEDBBlobStream.Create Method

```
constructor Create(Field: TBlobField; Mode: TBlobStreamMode)
```

Call the Create constructor to create an instance of the TEDBBlobStream class.

TEDBBlobStream.Read Method

```
function Read(var Buffer; Count: LongInt): LongInt
```

Read transfers up to Count bytes from the BLOB or CLOB column into Buffer, starting in the current position, and then advances the current position by the number of bytes actually transferred. Read returns the number of bytes actually transferred (which may be less than the number requested in Count). Buffer must have at least Count bytes allocated to hold the data that was read from the column.

All the other reading methods of a TEDBBlobStream object (ReadBuffer, ReadComponent) call Read to do their actual reading.

Note
Do not call Read when the TEDBBlobStream object was created in bmWrite mode. Also, please remember that if you are using a stream on a CLOB column using a Unicode version of ElevateDB, then the number of characters in the CLOB column will not be equal to the number of bytes in the stream like it is with an ANSI version of ElevateDB.

TEDBBlobStream.Seek Method

```
function Seek(Offset: LongInt; Origin: Word): LongInt

function Seek(const Offset: Int64; Origin: TSeekOrigin): Int64
```

Use Seek to move the current position within the BLOB or CLOB column by the indicated offset. Seek allows an application to read from or write to a particular location within the BLOB or CLOB column.

The Origin parameter indicates how to interpret the Offset parameter. Origin should be one of the following values:

Origin	Description
soFromBeginning	Offset is from the beginning of the BLOB or CLOB column. Seek moves to the position Offset. Offset must be >= 0.
soFromCurrent	Offset is from the current position in the BLOB or CLOB column. Seek moves to Position + Offset.
soFromEnd	Offset is from the end of the BLOB or CLOB column. Offset must be <= 0 to indicate a number of bytes before the end of the BLOB or CLOB.

Seek returns the new value of the Position property, the new current position in the BLOB or CLOB column.

Note
Please remember that if you are using a stream on a CLOB column using a Unicode version of ElevateDB, then the number of characters in the CLOB column will not be equal to the number of bytes in the stream like it is with an ANSI version of ElevateDB.

TEDBBlobStream.Truncate Method

```
procedure Truncate
```

Use Truncate to limit the size of the BLOB or CLOB column. Calling Truncate when the current position is 0 will clear the contents of the BLOB or CLOB column.

Note
Do not call Truncate when the TEDBBlobStream was created in bmRead mode. Please remember that if you are using a stream on a CLOB column using a Unicode version of ElevateDB, then the number of characters in the CLOB column will not be equal to the number of bytes in the stream like it is with an ANSI version of ElevateDB.

TEDBBlobStream.Write Method

```
function Write(const Buffer; Count: LongInt): LongInt
```

Use Write to write Count bytes to the BLOB or CLOB column, starting at the current position.

All the other data-writing methods of a TEDBBlobStream object (WriteBuffer, WriteComponent) call Write to do their actual writing.

Note
Do not call Write when the TEDBBlobStream object was created in bmRead mode. Also, please remember that if you are using a stream on a CLOB column using a Unicode version of ElevateDB, then the number of characters in the CLOB column will not be equal to the number of bytes in the stream like it is with an ANSI version of ElevateDB.

6.3 TEDBDatabase Component

Unit: edbcomps

Inherits From TCustomConnection

Use the TEDBDatabase component to manage a database within an application. You may have multiple TEDBDatabase components referring to the same database and they will share the same transaction status, etc.

> **Note**
> Explicit declaration of a TEDBDatabase component for each database connection in an application is optional if the application does not need to explicitly control that database. If a TEDBDatabase component is not explicitly declared and instantiated for a database, a temporary TEDBDatabase component with a default set of properties is created for it at runtime.

Properties	Methods	Events
Database	CloseDataSets	OnLogMessage
DatabaseName	Commit	OnProgress
DataSets	Execute	OnStatusMessage
EngineVersion	ExecuteScript	
Handle	Rollback	
InTransaction	StartTransaction	
KeepConnection	TableInTransaction	
Session	ValidateName	
SessionName		
Temporary		

TEDBDatabase.Database Property

```
property Database: String
```

Use the Database property to specify the actual ElevateDB database that will be accessed by this TEDBDatabase component.

Note
Attempting to set this property when the Connected property of the TEDBDatabase component is True will result in an exception being raised.

TEDBDatabase.DatabaseName Property

```
property DatabaseName: String
```

Use the DatabaseName property to specify the name of the database to associate with this TEDBDatabase component. The database name is arbitrary and is used only for identification of the database when connecting TEDBTable, TEDBQuery, and TEDBStoredProc components. It is best to think of the DatabaseName as an alias to the actual database, which is represented by the Database property. The DatabaseName property must begin with an alpha character.

Note
Attempting to set this property when the Connected property of the TEDBDatabase component is True will result in an exception being raised.

TEDBDatabase.DataSets Property

```
property DataSets[Index: Integer]: TEDBDBDataSet
```

The DataSets property provides an indexed array of all active datasets for a TEDBDatabase component. An active dataset is one that is currently open.

Note
A "dataset" is a TEDBTable, TEDBQuery, or TEDBStoredProc component, all of which descend from the TEDBDBDataSet component.

TEDBDatabase.EngineVersion Property

```
property EngineVersion: String
```

Indicates the current version of ElevateDB being used. This property is read-only.

TEDBDatabase.Handle Property

```
property Handle: TEDBDatabaseManager
```

The Handle property is for internal use only and is not useful to the application developer using ElevateDB.

TEDBDatabase.InTransaction Property

```
property InTransaction: Boolean
```

Use the InTransaction property at run-time to determine if a transaction is currently in progress. The InTransaction property is True if a transaction is in progress and False if a transaction is not in progress.

The value of the InTransaction property cannot be changed directly. Calling the TEDBDatabase StartTransaction sets the InTransaction property to True. Calling the TEDBDatabase Commit or Rollback methods sets the InTransaction property to False.

Note
If the current TEDBDatabase component refers to the same database as another TEDBDatabase component, then calling StartTransaction on one component will also cause the other component's InTransaction property to return True. This is because ElevateDB never allocates more than one internal handle for a given database.

TEDBDatabase.KeepConnection Property

```
property KeepConnection: Boolean
```

Use the KeepConnection property to specify whether an application remains connected to a database even if no datasets are open. When the KeepConnection property is True (the default) the connection is maintained. When the KeepConnection property is False a connection is dropped when there are no open datasets. Dropping a connection releases system resources allocated to the connection, but if a dataset is later opened that uses the database, the connection must be reestablished and initialized.

Note
The KeepConnection property setting for temporary TEDBDatabase components created automatically as needed is determined by the KeepConnections property of the TEDBSession component that the TEDBDatabase component is linked to via its SessionName property.

TEDBDatabase.Session Property

```
property Session: TEDBSession
```

Use the Session property to determine the TEDBSession component that the TEDBDatabase component is linked to. By default, a TEDBDatabase component is linked with the default TEDBSession component that is automatically created for all applications and can be referenced via the global Session function in the edbcomps unit. To assign a TEDBDatabase component to a different session, specify the name of a different TEDBSession component in the SessionName property.

TEDBDatabase.SessionName Property

```
property SessionName: String
```

Use the SessionName property to specify the session with which the TEDBDatabase component is linked. If the SessionName property is blank, a TEDBDatabase component is automatically linked with the default TEDBSession component that can be referenced via the global Session function in the edbcomps unit. To link a TEDBDatabase component with a different session in an application, the SessionName property must match the SessionName property of an existing TEDBSession component.

TEDBDatabase.Temporary Property

```
property Temporary: Boolean
```

The Temporary property indicates whether a TEDBDatabase component is temporary and created by ElevateDB as needed, or persistent and explicitly created, managed, and freed within the application. A temporary TEDBDatabase component is created when a dataset is opened and the dataset is not already linked with an existing TEDBDatabase component via its DatabaseName property. If Temporary remains True, then a temporary TEDBDatabase component is freed when the dataset is closed. An application can prevent the destruction of a temporary TEDBDatabase component by setting Temporary to False while the dataset is active, but the application is then responsible for closing the TEDBDatabase component when it is no longer needed.

Note
A "dataset" is a TEDBTable, TEDBQuery, or TEDBStoredProc component, all of which descend from the TEDBDBDataSet component.

TEDBDatabase.CloseDataSets Method

```
procedure CloseDataSets
```

Call the CloseDataSets method to close all active datasets without disconnecting from the database. Ordinarily, when an application calls the Close method, all datasets are closed, and the connection to the database is dropped. Calling CloseDataSets instead of Close ensures that an application can close all active datasets without having to reconnect to the database at a later time.

TEDBDatabase.Commit Method

```
procedure Commit(ForceFlush: Boolean=True)
```

Call the Commit method to permanently store to the database all row updates, insertions, and deletions that have occurred within the current transaction and then end the transaction. The current transaction is the last transaction started by calling the StartTransaction method. The optional ForceFlush parameter allows you to specifically indicate whether the commit should also perform an operating system flush of the committed data. The default value is True.

Note
Before calling the Commit method, an application may check the status of the InTransaction property. If an application calls Commit and there is no current transaction, an exception is raised.

TEDBDatabase.Execute Method

```
function Execute(const SQL: String; Params: TParams=nil; Query:
      TEDBQuery=nil): Integer
```

Call the Execute method to execute an SQL statement directly. The number of rows affected is returned as the result of this method. The SQL statement may also be parameterized.

Note
You may pass in a TEDBQuery component that has already been created for use with this method. However, in such a case you should be aware that several properties of the TEDBQuery component will be overwritten by this method in order to execute the SQL.

TEDBDatabase.ExecuteScript Method

```
procedure ExecuteScript(const SQL: String; Params: TParams=nil;
      Script: TEDBScript=nil)
```

Call the ExecuteScript method to execute an SQL script directly. The SQL script may also be parameterized.

Note
You may pass in a TEDBScript component that has already been created for use with this method. However, in such a case you should be aware that several properties of the TEDBScript component will be overwritten by this method in order to execute the script.

TEDBDatabase.Rollback Method

```
procedure Rollback
```

Call the Rollback method to cancel all row updates, insertions, and deletions for the current transaction and to end the transaction. The current transaction is the last transaction started by calling the Rollback method.

Note
Before calling the Rollback method, an application may check the status of the InTransaction property. If an application calls the Rollback method and there is no current transaction, an exception is raised.

TEDBDatabase.StartTransaction Method

```
procedure StartTransaction(const Tables: TEDBStringsArray;
      Timeout: Integer=-1)

procedure StartTransaction(const Tables: array of const;
      Timeout: Integer=-1)
```

Call the StartTransaction method to begin a new transaction. Before calling the StartTransaction method, an application should check the status of the InTransaction property. If the InTransaction property is True, indicating that a transaction is already in progress, a subsequent call to StartTransaction without first calling the Commit or Rollback methods to end the current transaction will raise an exception.

The Tables parameter allows you to specify a list of table names that should be included in the transaction. This is called a restricted transaction, since it usually involves only a subset of the tables in the database. If the Tables parameter is nil or has a length of 0, then the transaction will encompass the entire database. To make things easier in cases where an empty array is required, we have included the following pre-declared empty array in the edbtype unit:

```
EmptyEDBStringsArray
```

Just pass this variable name to the StartTransaction method whenever you wish to start a transaction on the entire database.

After the StartTransaction method is called, any row updates, insertions, and deletions that take place on tables that are part of the active transaction are buffered by ElevateDB until an application calls the Commit method to save the changes or the Rollback method is to cancel them.

The Timeout parameter indicates how long a transaction will wait, in milliseconds, to acquire the necessary lock(s) to start the transaction. The default value is -1, which will cause the transaction to wait up to several minutes before issuing a lock failure exception.

Note
The transaction isolation level in ElevateDB is always serialized, meaning that ElevateDB will only allow one session at a time to have an active transaction on the same table or tables.

TEDBDatabase.TableInTransaction Method

```
function TableInTransaction(const TableName: String): Boolean
```

Use the TableInTransaction method to determine if a particular table is involved in the current transaction.

TEDBDatabase.ValidateName Method

```
procedure ValidateName(const Name: String)
```

Call the ValidateName method to prevent duplicate access to a TEDBDatabase component from within a single TEDBSession component. The Name parameter contains the DatabaseName of the TEDBDatabase component to test. If the TEDBDatabase component is already open, the ValidateName method raises an exception. If the TEDBDatabase component is not open, the procedure returns, and the application continues processing.

Note
Most applications should not need to call this method directly. It is called automatically each time a TEDBDatabase component is opened.

TEDBDatabase.OnLogMessage Event

```
property OnLogMessage: TEDBLogMessageEvent
```

The OnLogMessage event is fired when an SQL statement is executed via the Execute method and that statement generates log messages. Assign an event handler to the OnLogMessage event to save or display these log messages within your application. The following SQL statements will generate log messages:

ALTER TABLE
VERIFY TABLE
REPAIR TABLE
OPTIMIZE TABLE

TEDBDatabase.OnProgress Event

```
property OnProgress: TEDBProgressEvent
```

The OnProgress event is fired when an SQL statement is executed via the Execute method and that statement generates progress. Assign an event handler to the OnProgress event to display the progress in your application and to, optionally, abort the execution of the SQL statement by setting the Continue parameter to False. The following SQL statements will generate progress:

SELECT
INSERT
UPDATE
DELETE
ALTER TABLE
VERIFY TABLE
REPAIR TABLE
OPTIMIZE TABLE
IMPORT TABLE
EXPORT TABLE
MIGRATE DATABASE
BACKUP DATABASE
RESTORE DATABASE
SAVE UPDATES
LOAD UPDATES
COPY FILE
RENAME FILE
DELETE FILE

TEDBDatabase.OnStatusMessage Event

```
property OnStatusMessage: TEDBStatusMessageEvent
```

The OnStatusMessage event is fired when an SQL statement is executed via the Execute method and that statement generates status messages. Assign an event handler to the OnStatusMessage event to display these messages in your application. All SQL statements will generate status messages.

6.4 TEDBDataSet Component

Unit: edbcomps

Inherits From TDataSet

The TEDBDataSet component is a dataset component that defines ElevateDB-specific functionality for a dataset. Applications never use TEDBDataSet components directly. Instead they use the descendants of TEDBDataSet, the TEDBTable, TEDBQuery, and TEDBStoredProc components, which inherit its database-related properties and methods.

Properties	Methods	Events
AutoDisplayLabels	ApplyCachedUpdates	OnUpdateRecord
BookmarkSize	BeginCachedUpdates	
CachedUpdatesModified	CancelCachedUpdates	
CachingUpdates	Export	
CopyOnAppend	FlushBuffers	
FilterExecutionTime	GetCollationForField	
Handle	GetDayTimeIntervalTypeForField	
ReadOnly	GetYearMonthIntervalTypeForField	
RecordUpdateCounter	Import	
RemoteReadSize	LoadFromStream	
UpdateObject	LockCurrentRecord	
	RecordIsLocked	
	SaveToStream	
	UnlockAllRecords	
	UnlockCurrentRecord	

TEDBDataSet.AutoDisplayLabels Property

```
property AutoDisplayLabels: Boolean
```

Use the AutoDisplayLabels property to specify whether the descriptions for each column in the dataset should be automatically populated as the DisplayLabel property of each TField component defined for this TEDBDataSet component. Since the TDBGrid component uses the DisplayLabel property of a TField component automatically, this property is very useful when data will be displayed in a TDBGrid component.

Note
This method is only used in the context of the descendant TEDBTable, TEDBQuery, TEDBScript, and TEDBStoredProc components.

TEDBDataSet.BookmarkSize Property

```
property BookmarkSize: Integer
```

TEDBDataSet.CachedUpdatesModified Property

```
property CachedUpdatesModified: Boolean
```

TEDBDataSet.CachingUpdates Property

```
property CachingUpdates: Boolean
```

Use the CachingUpdates property to determine whether updates are being cached.

TEDBDataSet.CopyOnAppend Property

```
property CopyOnAppend: Boolean
```

Use the CopyOnAppend property to control whether the current or last row's contents should be copied automatically to any newly inserted or appended rows.

Note
Using the Append method will cause the last row to be copied, not the current row. If you wish to copy the current row's contents then you should use the Insert method. Also, this property is only used in the context of the descendant TEDBTable, TEDBQuery, TEDBScript, and TEDBStoredProc components.

TEDBDataSet.FilterExecutionTime Property

```
property FilterExecutionTime: Double
```

Use the FilterExecutionTime property to determine how long the current expression filter, specified via the Filter property, took to execute in seconds.

Note
This method is only used in the context of the descendant TEDBTable, TEDBQuery, TEDBScript, and TEDBStoredProc components.

TEDBDataSet.Handle Property

```
property Handle: TEDBCursor
```

The Handle property is for internal use only and is not useful to the application developer using ElevateDB.

TEDBDataSet.ReadOnly Property

```
property ReadOnly: Boolean
```

Use the ReadOnly property to prevent any updates to the dataset. The default value is False, meaning users can insert, update, and delete rows in the dataset. When the ReadOnly property is True, the dataset's CanModify property is False.

Note
This method is only used in the context of the descendant TEDBTable, TEDBQuery, TEDBScript, and TEDBStoredProc components.

TEDBDataSet.RecordUpdateCounter Property

```
property RecordUpdateCounter: Integer
```

Use the RecordUpdateCounter property to retrieve the update counter for the current row. ElevateDB tracks changes to rows using an update counter for each row, and any time a row is updated, the update counter will be incremented by 1.

Note
This method is only used in the context of the descendant TEDBTable, TEDBQuery, TEDBScript, and TEDBStoredProc components.

TEDBDataSet.RemoteReadSize Property

```
property RemoteReadSize: Integer
```

Use the RemoteReadSize property to specify how many rows should be read at once whenever a remote session needs to read rows from an ElevateDB Server. This property is most useful when performing a sequential navigation of a large remote table, view, or query result set on an ElevateDB Server. You should be careful to not set this property to too high of a value since doing so can result in excessive memory consumption and network traffic. This is especially true when the access to a remote table, view, or query result set is mostly random and not sequential.

Note
This method is only used in the context of the descendant TEDBTable, TEDBQuery, TEDBScript, and TEDBStoredProc components.

TEDBDataSet.UpdateObject Property

```
property UpdateObject: TEDBDataSetUpdateObject
```

Use the UpdateObject property to specify a TEDBUpdateSQL component that will be used to apply any updates from a TClientDataSet component via the IProvider support in ElevateDB.

Note
This method is only used in the context of the descendant TEDBTable, TEDBQuery, TEDBScript, and TEDBStoredProc components.

TEDBDataSet.ApplyCachedUpdates Method

```
procedure ApplyCachedUpdates(Options:
      TEDBApplyCachedUpdatesOptions=[])
```

Use the ApplyCachedUpdates method to begin the process of applying any inserts, updates, or deletes that were cached to the source table, view, or query result set.

TEDBDataSet.BeginCachedUpdates Method

```
procedure BeginCachedUpdates
```

Use the BeginCachedUpdates method to copy all rows to a temporary table that will be used for caching all inserts, updates, and deletes until the cached updates are applied using the ApplyCachedUpdates method or cancelled using the CancelCachedUpdates method.

TEDBDataSet.CancelCachedUpdates Method

```
procedure CancelCachedUpdates
```

Use the CancelCachedUpdates method to discard any cached updates and return the source table, view, or query result set to its original state.

TEDBDataSet.Export Method

```
procedure Export(const ExportFile: String; const StoreName:
      String; const ColumnsToExport: TEDBStringsArray=nil; Format:
      TEDBFileFormat=ffDelimited; Encoding: TEDBFileEncoding=feAuto;
      DelimiterChar: Char=SEPARATOR; QuoteChar: Char=DOUBLE_QUOTE;
      const DateFormatStr: String=ANSI_DATE_FORMAT; const
      TimeFormatStr: String=ANSI_TIME_FORMAT; const AMStr:
      String=ANSI_12HOUR_AM; const PMStr: String=ANSI_12HOUR_PM;
      DecimalChar: Char=ANSI_DECIMAL_SEPARATOR; const TrueStr:
      String=ANSI_TRUE; const FalseStr: String=ANSI_FALSE;
      IncludeHeaders: Boolean=False; MaxRows: Integer=-1)
```

Use this method to export the rows in a dataset to a delimited or XML file.

Note
This method is defined as a way to provide for the exporting of result sets, and is simply a method version of the SQL EXPORT TABLE statement in ElevateDB. Please consult the ElevateDB SQL Manual for more information on the various export options available in the EXPORT TABLE statement.

TEDBDataSet.FlushBuffers Method

```
procedure FlushBuffers
```

Use the FlushBuffers method to flush data to disk. If the table, view, or query result set being updated is opened exclusively, then the FlushBuffers method flushes all cached writes in ElevateDB to disk and proceeds to instruct the operating system to flush all cached writes to disk also. If the table, view, or query result set is opened shared, then FlushBuffers only instructs the operating system to flush all cached writes to disk since shared datasets in ElevateDB do not cache any writes.

Note
This method is only used in the context of the descendant TEDBTable, TEDBQuery, TEDBScript, and TEDBStoredProc components.

TEDBDataSet.GetCollationForField Method

```
function GetCollationForField(const FieldName: String): String
```

Use the GetCollationForField method to retrieve the collation name for a given CHAR/VARCHAR/CLOB column.

TEDBDataSet.GetDayTimeIntervalTypeForField Method

```
function GetDayTimeIntervalTypeForField(const FieldName:
      String): TEDBDayTimeIntervalType
```

Use the GetDayTimeIntervalTypeForField method to retrieve the interval type for a given DAY-TIME INTERVAL column. This is useful when trying to format interval values properly for display in data-aware controls.

TEDBDataSet.GetYearMonthIntervalTypeForField Method

```
function GetYearMonthIntervalTypeForField(const FieldName:
      String): TEDBYearMonthIntervalType
```

Use the GetYearMonthIntervalTypeForField method to retrieve the interval type for a given YEAR-MONTH INTERVAL column. This is useful when trying to format interval values properly for display in data-aware controls.

TEDBDataSet.Import Method

```
procedure Import(const ImportFile: String; const StoreName:
      String; const ColumnsToImport: TEDBStringsArray=nil; Format:
      TEDBFileFormat=ffDelimited; Encoding: TEDBFileEncoding=feAuto;
      DelimiterChar: Char=SEPARATOR; QuoteChar: Char=DOUBLE_QUOTE;
      const DateFormatStr: String=ANSI_DATE_FORMAT; const
      TimeFormatStr: String=ANSI_TIME_FORMAT; const AMStr:
      String=ANSI_12HOUR_AM; const PMStr: String=ANSI_12HOUR_PM;
      DecimalChar: Char=ANSI_DECIMAL_SEPARATOR; const TrueStr:
      String=ANSI_TRUE; const FalseStr: String=ANSI_FALSE; UseHeaders:
      Boolean=False; MaxRows: Integer=-1)
```

Use this method to import rows into a dataset from a delimited or XML file.

Note
This method is defined as a way to provide for the importing of result sets, and is simply a method version of the SQL IMPORT TABLE statement in ElevateDB. Please consult the ElevateDB SQL Manual for more information on the various import options available in the IMPORT TABLE statement.

TEDBDataSet.LoadFromStream Method

```
procedure LoadFromStream(SourceStream: TStream)
```

Call the LoadFromStream method to load the contents of a table, view, or query result set from a stream containing data previously created using the SaveToStream method. The table, view, or query result set must first be opened or generated by calling the Open, ExecSQL, or ExecProc methods.

Note
This method is only used in the context of the descendant TEDBTable, TEDBQuery, TEDBScript, and TEDBStoredProc components.

TEDBDataSet.LockCurrentRecord Method

```
procedure LockCurrentRecord
```

Use the LockCurrentRecord method to manually lock the current row. Row locks established via this method are persistent and are maintained across any Edit or Delete calls. You must manually unlock any rows locked using this method via the UnlockCurrentRecord or UnlockAllRecords methods.

Note
Any row locks established using this method are automatically unlocked when the current dataset is closed.

Note
This method is only used in the context of the descendant TEDBTable, TEDBQuery, TEDBScript, and TEDBStoredProc components.

TEDBDataSet.RecordIsLocked Method

```
function RecordIsLocked: Boolean
```

Use this method to determine if the current row has been locked by the LockCurrentRecord method. This method only includes manually-locked rows and will not indicate if a row is locked via the Edit method when the current session's RecordLockProtocol is set to lpPessimistic. Such row locks are considered implicit.

Note
This method is only used in the context of the descendant TEDBTable, TEDBQuery, TEDBScript, and TEDBStoredProc components.

TEDBDataSet.SaveToStream Method

```
procedure SaveToStream(DestStream: TStream)
```

Call the SaveToStream method to save the contents of a table, view, or query result set to a stream. You can then use LoadFromStream method to load the data from the stream using another TEDBTable, TEDBQuery, or TEDBStoredProc component.The table, view, or query result set must first be opened or generated by calling the Open, ExecSQL, or ExecProc methods. This method will respect any active filters on the query result set when copying the data to the stream.

Note
Do not use this method with very large tables, views, or query result sets. It is recommended that you do not use it with tables, views, or query result sets over a few megs in size. Also, this method is only used in the context of the descendant TEDBTable, TEDBQuery, and TEDBStoredProc components.

TEDBDataSet.UnlockAllRecords Method

```
procedure UnlockAllRecords
```

Use this method to unlock all rows that have been manually locked using the LockCurrentRecord method.

Note
This method is only used in the context of the descendant TEDBTable, TEDBQuery, TEDBScript, and TEDBStoredProc components.

TEDBDataSet.UnlockCurrentRecord Method

```
procedure UnlockCurrentRecord
```

Use this method to unlock the current row. If the current row was not previously manually locked using the LockCurrentRecord method, then this method does nothing. You can use the RecordIsLocked method to determine if the current row is manually locked.

Note
This method is only used in the context of the descendant TEDBTable, TEDBQuery, TEDBScript, and TEDBStoredProc components.

TEDBDataSet.OnUpdateRecord Event

```
property OnUpdateRecord: TUpdateRecordEvent
```

The OnUpdateRecord event is fired when the IProvider support in ElevateDB is attempting to apply an update from a TClientDataSet component. Write an event handler for this event to intercept an update before it is applied automatically by ElevateDB. This will allow you to provide custom processing for situations where the standard update processing is not sufficient.

Note
This method is only used in the context of the descendant TEDBTable, TEDBQuery, TEDBScript, and TEDBStoredProc components.

6.5 TEDBDBDataSet Component

Unit: edbcomps

Inherits From TEDBDataSet

The TEDBDBDataSet component is a dataset component that defines database-related connectivity properties and methods for an ElevateDB dataset. Applications never use TEDBDBDataSet components directly. Instead they use the descendants of TEDBDBDataSet, the TEDBTable, TEDBQuery, and TEDBStoredProc components, which inherit its database-related properties and methods.

Properties	Methods	Events
Database	CloseDatabase	
DatabaseName	OpenDatabase	
DBHandle		
DBSession		
SessionName		

TEDBDBDataSet.Database Property

```
property Database: TEDBDatabase
```

Use the Database property to access the properties, events, and methods of the TEDBDatabase component linked to this TEDBDBDataSet component. The Database property is read-only and is automatically set when the database specified by the DatabaseName property is opened.

Note
This method is only used in the context of the descendant TEDBTable, TEDBQuery, TEDBScript, and TEDBStoredProc components.

TEDBDBDataSet.DatabaseName Property

```
property DatabaseName: String
```

Use the DatabaseName property to specify the name of the TEDBDatabase component to link to this TEDBDBDataSet component. The DatabaseName property should match the DatabaseName property of an existing TEDBDatabase component or should specify a valid database name.

Note
Attempting to set the DatabaseName property when the TEDBDBDataSet component is open (Active=True) will raise an exception. Also, this property is only used in the context of the descendant TEDBTable, TEDBQuery, and TEDBStoredProc components.

TEDBDBDataSet.DBHandle Property

```
property DBHandle: TEDBDatabaseManager
```

The DBHandle property is for internal use only and is not useful to the application developer using ElevateDB.

TEDBDBDataSet.DBSession Property

```
property DBSession: TEDBSession
```

The Handle property is for internal use only and is not useful to the application developer using ElevateDB.

TEDBDBDataSet.SessionName Property

```
property SessionName: String
```

Use the SessionName property to specify the TEDBSession component to link to this TEDBDBDataSet component. If the SessionName property is blank, the TEDBDBDataSet component is automatically linked to the default TEDBSession component, which can be referenced via the global Session function in the edbcomps unit. To link the TEDBDBDataset component with a different TEDBSession component, the SessionName property must match the SessionName property of an existing TEDBSession component.

Note
This method is only used in the context of the descendant TEDBTable, TEDBQuery, TEDBScript, and TEDBStoredProc components.

TEDBDBDataSet.CloseDatabase Method

```
procedure CloseDatabase(Database: TEDBDatabase)
```

The CloseDatabase method is just a local version of the TEDBSession CloseDatabase method for the TEDBSession that the TEDBDBDataSet is linked to via its SessionName property.

TEDBDBDataSet.OpenDatabase Method

```
function OpenDatabase: TEDBDatabase
```

The OpenDatabase method is just a local version of the TEDBSession OpenDatabase method for the TEDBSession that the TEDBDBDataSet is linked to via its SessionName property.

6.6 TEDBEngine Component

Unit: edbcomps

Inherits From TComponent

Use the TEDBEngine component to manage the ElevateDB engine from within an application. The ElevateDB engine can behave as either a client engine or as an ElevateDB Server.

A default TEDBEngine component is created automatically when the application is started and can be referenced via the global Engine function in the edbcomps unit.

Properties	Methods	Events
Active	AddDayTimeToDateTime	AfterStart
BackupExtension	AddDayTimeToTime	AfterStop
BufferedFileIO	AddYearMonthToDate	BeforeStart
BufferedFileIOFlushInterval	AddYearMonthToDateTime	BeforeStop
BufferedFileIOSettings	BinaryToSQLStr	OnServerProcedure
CacheModules	BooleanToSQLStr	OnServerSessionEvent
CatalogExtension	Close	OnServerSessionLogin
CatalogName	Create	OnServerTrace
CharacterSet	CurrToSQLStr	
ConfigExtension	DateTimeToSQLStr	
ConfigMemory	DateToSQLStr	
ConfigName	DayTimeIntervalToSQLStr	
ConfigPath	DisconnectServerSession	
EncryptionPassword	FindSession	
EngineType	FloatToSQLStr	
EngineVersion	GetServerConnectedSessionCount	
Handle	GetServerSessionCount	
LicensedSessions	GetServerUpTime	
LockExtension	GetServerUTCDateTime	
LogCategories	GetSessionNames	
LogExtension	GetTempTablesPath	
MaxLogFileSize	Open	
ServerAddress	OpenSession	
ServerAuthorizedAddresses	QuotedSQLStr	
ServerBlockedAddresses	RemoveServerSession	
ServerDeadSessionExpiration	SQLStrToBinary	

ServerDeadSessionInterval	SQLStrToBoolean	
ServerDescription	SQLStrToCurr	
ServerEncryptedOnly	SQLStrToDate	
ServerEncryptionPassword	SQLStrToDateTime	
ServerJobCategory	SQLStrToDayTimeInterval	
ServerJobRetries	SQLStrToFloat	
ServerMaxDeadSessions	SQLStrToTime	
ServerName	SQLStrToYearMonthInterval	
ServerPort	SubtractDateFromDateAsDayTime	
ServerRunJobs	SubtractDateFromDateAsYearMonth	
ServerSessionTimeout	SubtractDateTimeFromDateTimeAsDayTime	
ServerThreadCacheSize	SubtractDayTimeFromDateTime	
ServerTrace	SubtractDayTimeFromTime	
SessionCount	SubtractTimeFromTimeAsDayTime	
SessionList	SubtractYearMonthFromDate	
Sessions	SubtractYearMonthFromDateTime	
ShowDatabaseCatalogInfo	TimeToSQLStr	
ShowUserPasswords	YearMonthIntervalToSQLStr	
Signature		
StoreActive		
TableBlobExtension		
TableExtension		
TableIndexExtension		
TablePublishExtension		
TempTablesPath		
UpdateExtension		
UseLocalSessionEngineSettings		

TEDBEngine.Active Property

```
property Active: Boolean
```

Use the Active property to specify whether or not the engine is active. Setting Active to True starts the engine.

If the EngineType property is set to etClient, then ElevateDB will attempt to start the engine as client engine.

If the EngineType property is set to etServer, then ElevateDB will attempt to start the engine as an ElevateDB Server.

The BeforeStart event will be triggered before the engine is started, and the AfterStart event will be triggered after the engine has been successfully started.

Setting Active to False closes any open datasets, disconnects active database connections, and stops all active sessions.

TEDBEngine.BackupExtension Property

```
property BackupExtension: String
```

Use the BackupExtension property to specify the extension to be used for ElevateDB backup files. Please see the Backing Up and Restoring Databases for more information on backup files. The default value is ".EDBBkp".

Note
The Active property must be False in order to assign a value to this property.

TEDBEngine.BufferedFileIO Property

```
property BufferedFileIO: Boolean
```

Use the BufferedFileIO property to specify whether buffered file I/O buffering will be enabled. The default value is False. If buffered file I/O is enabled, you can use the BufferedFileIOSettings and BufferedFileIOFlushInterval properties to configure how the buffered file I/O behaves.

TEDBEngine.BufferedFileIOFlushInterval Property

```
property BufferedFileIOFlushInterval: Integer
```

When the BufferedFileIO property is True, specifies how often ElevateDB will check buffered files to see if there are any dirty buffers that need to be written. The default value is 60 seconds.

TEDBEngine.BufferedFileIOSettings Property

```
property BufferedFileIOSettings: TStrings
```

Specifies the buffered file I/O settings for various file specifications. Each setting is specified on a separate line of the string list and is a comma-delimited list of values that make up the buffer settings.

Setting	Description
File Specification	The file specification is a file name mask and can contain wildcards (*). The file specification mask can include paths, or one can use a wildcard to match on all paths. There is no default value for this setting and you must specify a file mask. The file specification should be enclosed in double-quotes (") in order to allow the proper parsing of file specifications containing spaces and other special characters.
Block Size	This setting controls the size, in KB, of file blocks that will be used for buffering any file that matches the file specification mask. The default value is 4KB.
Buffer Size	This setting controls the maximum amount of memory, in MB, that will be used for buffering any file that matches the file specification mask. The default value is 8MB.
Flush Age	This setting controls how long, in seconds, a dirty file block buffer will stay in the buffer pool before ElevateDB automatically writes the dirty buffer to the file that matches the file specification mask. This setting helps to alleviate issues with dirty buffers not being written to the file on a regular basis because the buffer size is configured too large for the current file size. The default value is 120 seconds.
Flush to Disk	This setting controls whether any writes to any file that matches the file specification mask will be followed by a disk flush call to the operating system. The default value is False.

Note
These settings are evaluated by ElevateDB from back-to-front, so you should specify the settings from general file specifications to very specific file specifications in the string list.

TEDBEngine.CacheModules Property

```
property CacheModules: Boolean
```

Use the CacheModules property to specify whether external modules will be loaded once into memory and cached there until the current session is closed. Setting this property to True can result in significant performance improvements. This is especially true for configurations with many different external modules. The default value is False.

Note
Setting this property to True will prevent you from replacing any of the external modules on disk while the session is active.

TEDBEngine.CatalogExtension Property

```
property CatalogExtension: String
```

Use the CatalogExtension property to specify the extension to be used for ElevateDB database catalogs. This property is used in conjunction with the CatalogName property to form the full name of a database catalog. The default value is ".EDBCat".

Note
The Active property must be False in order to assign a value to this property.

TEDBEngine.CatalogName Property

```
property CatalogName: String
```

Use the CatalogName property to specify the name to be used for ElevateDB database catalogs. This property is used in conjunction with the CatalogExtension property to form the full name of a database catalog. The default value is "EDBDatabase".

Note
The Active property must be False in order to assign a value to this property.

TEDBEngine.CharacterSet Property

```
property CharacterSet: TEDBCharacterSet
```

Use the CharacterSet property to specify the character set to use with the engine and, subsequently, all local and remote sessions used with the engine.

Note
The default value for this property will always be determined by the default string type of the compiler being used. For example, with Delphi XE the default string type is a Unicode string, so this property will default to csUnicode when used with Delphi XE.

TEDBEngine.ConfigExtension Property

```
property ConfigExtension: String
```

Use the ConfigExtension property to specify the extension to be used for ElevateDB configuration files. This property is used in conjunction with the ConfigName property to form the full name of a configuration file. The default value is ".EDBCfg".

Note
The Active property must be False in order to assign a value to this property.

TEDBEngine.ConfigMemory Property

```
property ConfigMemory: Boolean
```

Use the ConfigMemory property to specify that the configuration file will be "virtual" for ElevateDB, and reside only in the process's memory. The configuration file is used to store the contents of the system-created Configuration Database.

Warning
All applications accessing the same databases must use the same configuration file. Failure to do so will result in locking errors. This means that if one application is accessing a database with a virtual configuration file, then all applications accessing the same database must all be using virtual configuration files. Also, when using virtual configurations, you will have to recreate all necessary database, user/role, job, and store definitions every time the application is started, although the default users and roles will always be created for you. Finally, the Active property must be False in order to assign a value to this property.

TEDBEngine.ConfigName Property

```
property ConfigName: String
```

Use the ConfigName property to specify the name to be used for ElevateDB configuration files. This property is used in conjunction with the ConfigExtension property to form the full name of a configuration file. The default value is "EDBConfig".

Note
The Active property must be False in order to assign a value to this property.

TEDBEngine.ConfigPath Property

```
property ConfigPath: String
```

Use the ConfigPath property to specify the path to the configuration file to use for ElevateDB. The configuration file is used to store the contents of the system-created Configuration Database.

Warning
All applications accessing the same databases must use the same configuration file. Failure to do so will result in locking errors. Also, it is recommended that you do not use relative path names for this property. Complete UNC path names are the most reliable since they do not rely on local drive mappings. Finally, the Active property must be False in order to assign a value to this property.

TEDBEngine.EncryptionPassword Property

```
property EncryptionPassword: String
```

Use the EncryptionPassword property to specify the encryption password used by ElevateDB for all encryption purposes. ElevateDB uses this password for all configuration, database catalog (for encrypted catalogs), and table files (for encrypted tables) encryption. The default value is 'elevatesoft'.

Note
The Active property must be False in order to assign a value to this property.

TEDBEngine.EngineType Property

```
property EngineType: TEDBEngineType
```

Use the EngineType property to specify whether the engine should behave as a local, client engine (the default) or as an ElevateDB Server engine. ElevateDB only allows one instance of the TEDBEngine component per application, which means that an application can only behave as a local, client application, or as an ElevateDB Server application, but not both.

Note
The Active property must be False in order to assign a value to this property.

TEDBEngine.EngineVersion Property

```
property EngineVersion: String
```

Indicates the current version of ElevateDB being used. This property is read-only.

TEDBEngine.Handle Property

```
property Handle: TEDBEngineManager
```

The Handle property is for internal use only and is not useful to the application developer using ElevateDB.

TEDBEngine.LicensedSessions Property

```
property LicensedSessions: Integer
```

Use the LicensedSessions property to specify the maximum number of licensed sessions allowed to access the configuration file specified by the ConfigPath, ConfigName, and ConfigExtension properties.

Note
The Active property must be False in order to assign a value to this property.

TEDBEngine.LockExtension Property

```
property LockExtension: String
```

Use the LockExtension property to specify the extension to be used for ElevateDB configuration lock files and database catalog lock files. This property is used in conjunction with the ConfigName and CatalogName properties to form the full name of configuration lock files and database catalog lock files. The default value is ".EDBLck".

Note
The Active property must be False in order to assign a value to this property.

TEDBEngine.LogCategories Property

```
property LogCategories: TEDBLogCategories
```

Use the LogCategories property to specify which type of events should be logged by the engine to the configuration log file specified by the ConfigName and LogExtension properties. The configuration log file is stored in the path specified by the ConfigPath property. The default value is all categories - errors, warnings, and information.

Note
The Active property must be False in order to assign a value to this property.

TEDBEngine.LogExtension Property

```
property LogExtension: String
```

Use the LogExtension property to specify the extension to be used for ElevateDB configuration log files. This property is used in conjunction with the ConfigName properties to form the full name of configuration log files. The configuration log file is stored in the path specified by the ConfigPath property. The default value is ".EDBLog".

Note
The Active property must be False in order to assign a value to this property.

TEDBEngine.MaxLogFileSize Property

```
property MaxLogFileSize: Integer
```

Use the MaxLogFileSize property to specify the maximum file size to be used for the configuration log file specified by the ConfigName and LogExtension properties. The configuration log file is stored in the path specified by the ConfigPath property.

Note
The Active property must be False in order to assign a value to this property.

TEDBEngine.ServerAddress Property

```
property ServerAddress: String
```

Use the ServerAddress property to specify the IP address that the ElevateDB Server should listen on for connections when the EngineType property is set to etServer. A blank value (the default) indicates that the ElevateDB Server should listen on all available IP addresses defined in the operating system for the machine.

Note
The Active property must be False in order to assign a value to this property.

TEDBEngine.ServerAuthorizedAddresses Property

```
property ServerAuthorizedAddresses: TStrings
```

Use the ServerAuthorizedAddresses property to specify which IP addresses are authorized to access the ElevateDB Server when the EngineType property is set to etServer. This is commonly referred to as a "white list". There is no limit to the number of addresses that can be specified, and the IP address entries may contain the asterisk (*) wildcard character to represent any portion of an address.

Note
The Active property must be False in order to assign a value to this property.

TEDBEngine.ServerBlockedAddresses Property

```
property ServerBlockedAddresses: TStrings
```

Use the ServerBlockedAddresses property to specify which IP addresses are not allowed to access the ElevateDB Server when the EngineType property is set to etServer. This is commonly referred to as a "black list". There is no limit to the number of addresses that can be specified, and the IP address entries may contain the asterisk (*) wildcard character to represent any portion of an address.

Note
The Active property must be False in order to assign a value to this property.

TEDBEngine.ServerDeadSessionExpiration Property

```
property ServerDeadSessionExpiration: Integer
```

Use the ServerDeadSessionExpiration property to specify how long a session can exist in the ElevateDB Server in a disconnected, or "dead", state before the server removes the session. This is done to prevent a situation where "dead" sessions accumulate from client applications whose network connections were permanently interrupted. This property only applies when the EngineType property is set to etServer. The default value is 300 seconds, or 5 minutes.

Note
The Active property must be False in order to assign a value to this property.

TEDBEngine.ServerDeadSessionInterval Property

```
property ServerDeadSessionInterval: Integer
```

Use the ServerDeadSessionInterval to specify how often the ElevateDB Server will poll the disconnected sessions to see if any need to be removed according to the ServerDeadSessionExpiration, or ServerMaxDeadSessions properties. This property only applies when the EngineType property is set to etServer. The default value is 30 seconds.

Note
The Active property must be False in order to assign a value to this property.

TEDBEngine.ServerDescription Property

```
property ServerDescription: String
```

Use the ServerDescription property to specify the description of the ElevateDB Server when the EngineType property is set to etServer. The default value is "ElevateDB Server". This description is used to describe the ElevateDB Server when a remote session asks for the description using the TEDBSession GetRemoteServerDescription method.

Note
The Active property must be False in order to assign a value to this property.

TEDBEngine.ServerEncryptedOnly Property

```
property ServerEncryptedOnly: Boolean
```

Use the ServerEncryptedOnly property to specify that the ElevateDB Server should only accept encrypted connections when the EngineType property is set to etServer. The default value is False.

Note
The Active property must be False in order to assign a value to this property.

TEDBEngine.ServerEncryptionPassword Property

```
property ServerEncryptionPassword: String
```

Use the ServerEncryptionPassword property to specify the encryption password the ElevateDB Server will use for all communications with remote sessions. The default value is 'elevatesoft'. This property only applies when the EngineType property is set to etServer.

Note
The Active property must be False in order to assign a value to this property.

TEDBEngine.ServerJobCategory Property

```
property ServerJobCategory: String
```

Use the ServerJobCategory property to specify which job category the ElevateDB Server will schedule and run if the ServerRunJobs property is set to True. This property can contain any value, and the default value is blank (''), which indicates that the server engine can run all job categories. This property only applies when the EngineType property is set to etServer.

Note
The Active property must be False in order to assign a value to this property.

TEDBEngine.ServerJobRetries Property

```
property ServerJobRetries: Integer
```

Use the ServerJobRetries property to specify how many times the ElevateDB Server will attempt to execute a given job before disabling the job. The default value is 10. This property only applies when the EngineType property is set to etServer.

Note
The Active property must be False in order to assign a value to this property.

TEDBEngine.ServerMaxDeadSessions Property

```
property ServerMaxDeadSessions: Integer
```

Use the ServerMaxDeadSessions property to specify how many "dead" sessions can accumulate in the ElevateDB Server before the server begins to remove them immediately, irrespective of the ServerDeadSessionExpiration property. If the ServerMaxDeadSessions property is exceeded, then the server engine removes the "dead" sessions in oldest-to-youngest order until the number of "dead" sessions is at or under the ServerMaxDeadSessions property setting. The default value for this property is 64. This property only applies when the EngineType property is set to etServer.

Note
The Active property must be False in order to assign a value to this property.

TEDBEngine.ServerName Property

```
property ServerName: String
```

Use the ServerName property to specify the name of the ElevateDB Server when the EngineType property is set to etServer. The default value is "EDBSrvr". This name is used when a remote session asks for it using the TEDBSession GetRemoteServerName method.

Note
The Active property must be False in order to assign a value to this property.

TEDBEngine.ServerPort Property

```
property ServerPort: Integer
```

Use the ServerPort property to specify the port that the ElevateDB Sserver should listen on for connections when the EngineType property is set to etServer. The default value is 12010.

Note
The Active property must be False in order to assign a value to this property.

TEDBEngine.ServerRunJobs Property

```
property ServerRunJobs: Boolean
```

Use the ServerRunJobs property to specify whether the ElevateDB Server is allowed to schedule and run jobs that are defined in the Configuration database. If this property is set to True (the default), then the ServerJobCategory property determines which category of jobs that the server will schedule and run. This property only applies when the EngineType property is set to etServer.

Note
The Active property must be False in order to assign a value to this property.

TEDBEngine.ServerSessionTimeout Property

```
property ServerSessionTimeout: Integer
```

Use the ServerSessionTimeout property to specify how long the ElevateDB Server should wait for a request from a connected remote session before it disconnects the session. This is done to keep the number of concurrent connections at a minimum. Once a session has been disconnected by the server, the session is then considered to be "dead" until either the remote session reconnects to the session in the server, or the server removes the session according to the parameters specified by the ServerDeadSessionInterval,ServerDeadSessionExpiration, or ServerMaxDeadSessions properties. The default value is 180 seconds, or 3 minutes. This property only applies when the EngineType property is set to etServer.

Note
The Active property must be False in order to assign a value to this property.

TEDBEngine.ServerThreadCacheSize Property

```
property ServerThreadCacheSize: Integer
```

Use the ServerThreadCacheSize property to specify the total number of threads that should be cached by the ElevateDB Server for connections when the EngineType property is set to etServer. The default value is 10. Caching threads helps improve connection times by eliminating the need to constantly create and destroy threads as remote sessions connect to and disconnect from the server.

Note
The Active property must be False in order to assign a value to this property.

TEDBEngine.ServerTrace Property

```
property ServerTrace: Boolean
```

Use the ServerTrace property to specify that the ElevateDB Server should trigger the OnServerTrace event for every request/reply to/from the ElevateDB Server when the EngineType property is set to etServer. The default value is False. Server-side tracing is useful for diagnosing issues with performance/locking that are hard to diagnose from the client side.

Warning
Do not enable this property in production without being aware of the consequences. Enabling this property can result in a significant amount of overhead, depending upon how the OnServerTrace event is handled. In the ElevateDB Server project that is provided with ElevateDB (see below), enabling this property will generate a large number of trace files that can easily consume large amounts of disk space on a busy server.

Note
The Active property must be False in order to assign a value to this property.

TEDBEngine.SessionCount Property

```
property SessionCount: Integer
```

Use the SessionCount property to determine how many sessions are currently created in the engine.

Note
This property only applies when the EngineType property is set to etClient.

TEDBEngine.SessionList Property

```
property SessionList[const SessionName: String]: TEDBSession
```

Use the SessionList property to access a given TEDBSession component by name. The name of a session is specified via the TEDBSession SessionName property.

Note
This property only applies when the EngineType property is set to etClient.

TEDBEngine.Sessions Property

```
property Sessions[Index: Integer]: TEDBSession
```

Use the Sessions property to access a given TEDBSession component by index. The Index parameter must be in the range of zero to the current value of the SessionCount property minus one.

Note
This property only applies when the EngineType property is set to etClient.

TEDBEngine.ShowDatabaseCatalogInfo Property

```
property ShowDatabaseCatalogInfo: Boolean
```

This property allows you to specify whether database catalog character set and version information should appear in the Databases system information table.

Note
Setting this property to False can significantly improve the performance of the loading of the Databases system information table when there are a lot of databases in a configuration. This is because ElevateDB has to open the database catalog for each database in order to read the character set and version number.

The default value of this property is True.

TEDBEngine.ShowUserPasswords Property

```
property ShowUserPasswords: Boolean
```

This property allows you to specify whether user passwords should appear in the Users system information table.

> **Note**
> Even with this propery enabled, only Administrators can see other users' passwords. Normal users that aren't assigned the Administrators role can only see their own user information.

The default value of this property is True.

TEDBEngine.Signature Property

```
property Signature: String
```

Use the Signature property to specify the signature to be used by the engine when accessing or creating configuration files, database catalogs, tables, backup files, or streams as well as any communications between a remote session and an ElevateDB Server. The default value of the Signature property is "edb_signature" and should not be changed unless you are sure of the consequences. Using a custom value for the Signature property will prevent any other application that uses ElevateDB from accessing any configuration files, database catalogs, tables, backup files, or streams created with the custom signature, as well as accessing an ElevateDB Server using the custom signature.

Note
The Active property must be False in order to assign a value to this property.

TEDBEngine.StoreActive Property

```
property StoreActive: Boolean
```

Use the StoreActive property to determine if the ElevateDB engine should store the current value of its Active property, and subsequently, the Active/Connected property values of all other ElevateDB components such as the TEDBDatabase, TEDBTable, TEDBQuery, and TEDBStoredProc components, in the owner form or data module. The default value for this property is True.

Setting this property to False will ensure that you never run into the situation where the TEDBEngine component's Active property is automatically set to True (its design-time state) when the owning form/data module is created at runtime. This is a common problem when a developer is working with the ElevateDB components at design-time, and then compiles the application with one or more of the ElevateDB components' Active/Connected property set to True. The end result is usually many ElevateDB runtime errors caused by the fact that the ElevateDB engine has not been configured for the target machine and operating system, but rather is still configured for the developer's machine and operating system.

TEDBEngine.TableBlobExtension Property

```
property TableBlobExtension: String
```

Use the TableBlobExtension to specify the file extension used by the engine for the physical BLOB file that makes up part of an ElevateDB table. The default value is ".EDBBlb". Be sure to always include the filename extension separator (.) when specifying the file extension.

Note
The Active property must be False in order to assign a value to this property.

TEDBEngine.TableExtension Property

```
property TableExtension: String
```

Use the TableDataExtension to specify the file extension used by the engine for the physical table file that makes up part of an ElevateDB table. The default value is ".EDBTbl". Be sure to always include the filename extension separator (.) when specifying the file extension.

Note
The Active property must be False in order to assign a value to this property.

TEDBEngine.TableIndexExtension Property

```
property TableIndexExtension: String
```

Use the TableIndexExtension to specify the file extension used by the engine for the physical index file that makes up part of an ElevateDB table. The default value is ".EDBIdx". Be sure to always include the filename extension separator (.) when specifying the file extension.

Note
The Active property must be False in order to assign a value to this property.

TEDBEngine.TablePublishExtension Property

```
property TablePublishExtension: String
```

Use the TablePublishExtension to specify the file extension used by the engine for the physical publish file that makes up part of an ElevateDB table. The default value is ".EDBPbl". Be sure to always include the filename extension separator (.) when specifying the file extension.

Note
The Active property must be False in order to assign a value to this property.

TEDBEngine.TempTablesPath Property

```
property TempTablesPath: String
```

Use the TempTablesPath property to specify where ElevateDB creates any temporary tables that are required for storing query result sets. By default, the TempTablesPath property is set to the user-specific temporary tables path for the operating system.

Note
The Active property must be False in order to assign a value to this property.

TEDBEngine.UpdateExtension Property

```
property UpdateExtension: String
```

Use the UpdateExtension property to specify the extension to be used for ElevateDB update files. Please see the Backing Up and Restoring Databases for more information on backup files. The default value is ".EDBUpd".

Note
The Active property must be False in order to assign a value to this property.

TEDBEngine.UseLocalSessionEngineSettings Property

```
property UseLocalSessionEngineSettings: Boolean
```

Use the UseLocalSessionEngineSettings property to indicate that you wish to have any TEDBSession component use its own Local* versions of the following TEDBEngine properties:

Signature
EncryptionPassword
ConfigPath
ConfigMemory
ConfigName
ConfigExtension
LockExtension
LogExtension
MaxLogFileSize
LogCategories
CatalogName
CatalogExtension
BackupExtension
TableExtension
TableIndexExtension
TableBlobExtension
TempTablesPath

The TEDBSession Local* property values will then override the above properties in the TEDBEngine component. This is useful for applications like the ElevateDB Manager that need to provide the ability to have multiple local sessions that use different engine settings. The default value for this property is False.

Note
Although the TEDBSession Local* versions of the above properties will override the corresponding TEDBEngine properties, they are initially set to the same value as the corresponding TEDBEngine properties when the TEDBSession component is first created.

TEDBEngine.AddDayTimeToDateTime Method

```
function AddDayTimeToDateTime(Value: TDateTime; DayTimeInterval:
      TEDBDayTimeInterval; DayTimeIntervalType:
      TEDBDayTimeIntervalType): TDateTime
```

Call the AddDayTimeToDateTime method to add a day-time interval to a date-time value and return the new date-time value.

Note
In ElevateDB, day-time intervals are Int64 values that represent the number of milliseconds that have elapsed between two points in time. Use the TEDBEngine DayTimeIntervalToSQLStr method to convert a day-time interval into a readable string.

TEDBEngine.AddDayTimeToTime Method

```
function AddDayTimeToTime(Value: TDateTime; DayTimeInterval:
      TEDBDayTimeInterval; DayTimeIntervalType:
      TEDBDayTimeIntervalType): TDateTime
```

Call the AddDayTimeToTime method to add a day-time interval to a time value and return the new time value.

Note
In ElevateDB, day-time intervals are Int64 values that represent the number of milliseconds that have elapsed between two points in time. Use the TEDBEngine DayTimeIntervalToSQLStr method to convert a day-time interval into a readable string.

TEDBEngine.AddYearMonthToDate Method

```
function AddYearMonthToDate(Value: TDateTime; YearMonthInterval:
      TEDBYearMonthInterval; YearMonthIntervalType:
      TEDBYearMonthIntervalType): TDateTime
```

Call the AddYearMonthToDate method to add a year-month interval to a date value and return the new date value.

Note
In ElevateDB, year-month intervals are Integer values that represent the number of days that have elapsed between two calendar days. Use the TEDBEngine YearMonthIntervalToSQLStr method to convert a year-month interval into a readable string.

TEDBEngine.AddYearMonthToDateTime Method

```
function AddYearMonthToDateTime(Value: TDateTime;
      YearMonthInterval: TEDBYearMonthInterval; YearMonthIntervalType:
      TEDBYearMonthIntervalType): TDateTime
```

Call the AddYearMonthToDateTime method to add a year-month interval to a date-time value and return the new date-time value.

Note
In ElevateDB, year-month intervals are Integer values that represent the number of days that have elapsed between two calendar days. Use the TEDBEngine YearMonthIntervalToSQLStr method to convert a year-month interval into a readable string.

TEDBEngine.BinaryToSQLStr Method

```
function BinaryToSQLStr(Value: TEDBBytes): String
```

Call the BinaryToSQLStr method to convert a TEDBBytes (byte array) value to an SQL 2003 standard binary constant string. All SQL and filter expressions in ElevateDB require standard binary constants, which are represented by the binary value in hexadecimal format.

Please see the Types topic for more information on the data types in ElevateDB and their literal representation.

TEDBEngine.BooleanToSQLStr Method

```
function BooleanToSQLStr(Value: Boolean): String
```

Call the BooleanToSQLStr method to convert a Boolean value to an SQL 2003 standard boolean constant string. All SQL and filter expressions in ElevateDB require standard boolean constants, which are TRUE and FALSE (case-insensitive).

Please see the Types topic for more information on the data types in ElevateDB and their literal representation.

TEDBEngine.Close Method

```
procedure Close
```

Call the Close method to stop the engine. Calling this method will change the Active property from True to False if the engine has been started, or it will do nothing if the Active property is already False.

TEDBEngine.Create Method

```
constructor Create(AOwner: TComponent)
```

Call the Create constructor to create an instance of the TEDBEngine component.

TEDBEngine.CurrToSQLStr Method

```
function CurrToSQLStr(Value: Currency; Scale: Integer=0): String
```

Call the CurrToSQLStr method to convert a Currency value to an SQL 2003 standard decimal constant string. All SQL and filter expressions in ElevateDB require standard decimal constants which use the period (.) as the decimal separator. Use the Scale parameter to specify the number of decimal places to use for the output string, or 0 to specify that the number of decimal places in the output string will depend upon the Currency value being converted.

Please see the Types topic for more information on the data types in ElevateDB and their literal representation.

TEDBEngine.DateTimeToSQLStr Method

```
function DateTimeToSQLStr(Value: TDateTime; MilitaryTime:
      Boolean=True): String
```

Call the DateTimeToSQLStr method to convert a TDateTime value to an SQL 2003 standard timestamp constant string. All SQL and filter expressions in ElevateDB require standard timestamp constants which use the 'yyyy-mm-dd hh:mm:ss.zzz am/pm' format. Use the MilitaryTime parameter to indicate whether the time should be returned in 24-hour format instead of 12-hour format with an am/pm indicator.

Please see the Types topic for more information on the data types in ElevateDB and their literal representation.

TEDBEngine.DateToSQLStr Method

```
function DateToSQLStr(Value: TDateTime): String
```

Call the DateToSQLStr method to convert a TDateTime value to an SQL 2003 standard date constant string. All SQL and filter expressions in ElevateDB require standard date constants which use the 'yyyy-mm-dd' format.

Please see the Types topic for more information on the data types in ElevateDB and their literal representation.

TEDBEngine.DayTimeIntervalToSQLStr Method

```
function DayTimeIntervalToSQLStr(Value: TEDBDayTimeInterval;
      DayTimeIntervalType: TEDBDayTimeIntervalType): String
```

Call the DayTimeIntervalToSQLStr method to convert a TEDBDayTimeInterval (Int64) value to an SQL 2003 standard day-time interval constant string. All SQL and filter expressions in ElevateDB require standard day-time interval constants which use the general 'dd hh:mm:ss.zzz am/pm' format. Use the DayTimeIntervalType parameter to indicate how the day-time interval should be formatted.

Please see the Types topic for more information on the data types in ElevateDB and their literal representation.

TEDBEngine.DisconnectServerSession Method

```
function DisconnectServerSession(SessionID: Integer): Boolean
```

Call the DisconnectServerSession method to disconnect a specific session on the ElevateDB Server. Disconnecting a session only terminates its connection, it does not remove the session completely from the server nor does it release any resources for the session other than the thread used for the connection and the connection itself at the operating system level. Use the SessionID parameter to specify the session ID to disconnect. You can log the session ID for a particular session by defining an event handler for the OnServerSessionEvent event and passing the session ID to this method.

Note
This method is only valid when the engine is running as an ElevateDB Server and the EngineType is set to etServer.

TEDBEngine.FindSession Method

```
function FindSession(const SessionName: String): TEDBSession
```

Use the FindSession method to search the list of TEDBSession components for a specified session name. SessionName specifies the session to search for.

FindSession compares the SessionName parameter to the SessionName property for each TEDBSession component in the available list of sessions in the engine. If a match is found, FindSession returns a reference to the applicable TEDBSession component. If an application passes an empty string in the SessionName parameter, FindSession returns the default global TEDBSession, Session. If a match is not found, FindSession returns nil.

Note
This method only applies when the EngineType property is set to etClient.

TEDBEngine.FloatToSQLStr Method

```
function FloatToSQLStr(Value: Double): String
```

Call the FloatToSQLStr method to convert a Double value to an SQL 2003 standard float constant string. All SQL and filter expressions in ElevateDB require standard float constants which use the period (.) as the decimal separator.

Please see the Types topic for more information on the data types in ElevateDB and their literal representation.

TEDBEngine.GetServerConnectedSessionCount Method

```
function GetServerConnectedSessionCount: Integer
```

Call the GetServerConnectedSessionCount method to retrieve the total number of connected sessions on the ElevateDB Server. Sessions that are present on the server, but not connected, are not reported in this figure. To get a total count of the number of sessions on the server use the GetServerSessionCount method instead.

Note
This method is only valid when the engine is running as an ElevateDB Server and the EngineType is set to etServer.

TEDBEngine.GetServerSessionCount Method

```
function GetServerSessionCount: Integer
```

Call the GetServerSessionCount method to retrieve the total number of sessions on the ElevateDB Server. To get a total count of just the number of connected sessions on the server use the GetServerConnectedSessionCount method instead.

Note
This method is only valid when the engine is running as an ElevateDB Server and the EngineType is set to etServer.

TEDBEngine.GetServerUpTime Method

```
function GetServerUpTime: Int64
```

Call the GetServerUpTime method to retrieve the number of seconds that the ElevateDB Server has been active and accepting new connections.

Note
This method is only valid when the engine is running as an ElevateDB Server and the EngineType is set to etServer.

TEDBEngine.GetServerUTCDateTime Method

```
function GetServerUTCDateTime: TDateTime
```

Call the GetServerUTCDateTime method to retrieve the universal coordinate date and time from the ElevateDB Server. This is especially useful if you wish to get the date and time in a standard format that doesn't need to take into account the local server time offset.

Note
This method is only valid when the engine is running as an ElevateDB Server and the EngineType is set to etServer.

TEDBEngine.GetSessionNames Method

```
procedure GetSessionNames(List: TStrings)
```

Call the GetSessionNames method to populate a string list with the names of all available TEDBSession components. The List parameter is a string list object, created and maintained by the application, into which to store session names. The names returned by GetSessionNames correspond to the SessionName properties of all available TEDBSession components.

Note
This method only applies when the EngineType property is set to etClient.

TEDBEngine.GetTempTablesPath Method

```
function GetTempTablesPath: String
```

Call the GetTempTablesPath method to return a string with the location of the operating system's default temporary files path for the current user.

TEDBEngine.Open Method

```
procedure Open
```

Call the Open method to start the engine. Calling this method will change the Active property from False to True if the engine has not been started, or it will do nothing if the Active property is already True.

TEDBEngine.OpenSession Method

```
function OpenSession(const SessionName: String): TEDBSession
```

Call the OpenSession method to make an existing TEDBSession component active, or to create a new TEDBSession component and make it active. SessionName specifies the name of the session to open.

OpenSession calls the TEDBEngine FindSession method to see if the TEDBSession component specified in the SessionName parameter already exists. If it finds a match via the SessionName property of an existing TEDBSession component, it starts that session if necessary, and makes the session active. If OpenSession does not find an existing TEDBSession component with that name, it creates a new TEDBSession component using the name specified in the SessionName parameter, starts the session, and makes it active.

In either case, OpenSession returns the TEDBSession component.

Note
This method only applies when the EngineType property is set to etClient.

TEDBEngine.QuotedSQLStr Method

```
function QuotedSQLStr(const Value: String): String
```

Call the QuotedSQLStr method to format a string constant so that it can properly used as a literal constant in an SQL statement. This method converts escapes all single quotes and converts all characters less than #32 (space) into the #<ASCII value> syntax.

TEDBEngine.RemoveServerSession Method

```
function RemoveServerSession(SessionID: Integer): Boolean;
```

Call the RemoveServerSession method to completely remove a specific session on the ElevateDB Server. Removing a session not only terminates its connection (if connected), but it also removes the session completely and releases any resources for the session including the thread used for the connection and the connection itself at the operating system level. Use the SessionID parameter to specify the session ID to remove. You can log the session ID for a particular session by defining an event handler for the OnServerSessionEvent event and passing the session ID to this method.

Note
This method is only valid when the engine is running as an ElevateDB Server and the EngineType is set to etServer.

TEDBEngine.SQLStrToBinary Method

```
function SQLStrToBinary(const Value: String): TEDBBytes
```

Call the SQLStrToBinary method to convert a string that contains an SQL 2003 standard binary constant to an actual TEDBBytes (byte array) value. All SQL and filter expressions in ElevateDB require standard binary constants, which are represented by the binary value in hexadecimal format.

Please see the Types topic for more information on the data types in ElevateDB and their literal representation.

TEDBEngine.SQLStrToBoolean Method

```
function SQLStrToBoolean(const Value: String): Boolean
```

Call the SQLStrToBoolean method to convert a string that contains an SQL 2003 standard boolean constant to an actual Boolean value. All SQL and filter expressions in ElevateDB require standard boolean constants, which are TRUE and FALSE (case-insensitive).

Please see the Types topic for more information on the data types in ElevateDB and their literal representation.

TEDBEngine.SQLStrToCurr Method

```
function SQLStrToCurr(const Value: String): Currency
```

Call the SQLStrToCurr method to convert a string that contains an SQL 2003 standard decimal constant to an actual Currency value. All SQL and filter expressions in ElevateDB require standard decimal constants which use the period (.) as the decimal separator.

Please see the Types topic for more information on the data types in ElevateDB and their literal representation.

TEDBEngine.SQLStrToDate Method

```
function SQLStrToDate(const Value: String): TDateTime
```

Call the SQLStrToDate method to convert a string that contains an SQL 2003 standard date constant to an actual TDateTime value. All SQL and filter expressions in ElevateDB require standard date constants which use the 'yyyy-mm-dd' format.

Please see the Types topic for more information on the data types in ElevateDB and their literal representation.

TEDBEngine.SQLStrToDateTime Method

```
function SQLStrToDateTime(const Value: String): TDateTime
```

Call the SQLStrToDateTime method to convert a string that contains an SQL 2003 standard timestamp constant to an actual TDateTime value.All SQL and filter expressions in ElevateDB require standard timestamp constants which use the 'yyyy-mm-dd hh:mm:ss.zzz am/pm' format.

Please see the Types topic for more information on the data types in ElevateDB and their literal representation.

TEDBEngine.SQLStrToDayTimeInterval Method

```
function SQLStrToDayTimeInterval(const Value: String;
      DayTimeIntervalType: TEDBDayTimeIntervalType):
      TEDBDayTimeInterval
```

Call the SQLStrToDayTimeInterval method to convert a string that contains an SQL 2003 standard day-time interval constant to an actual TEDBDayTimeInterval (Int64) value. All SQL and filter expressions in ElevateDB require standard day-time interval constants which use the 'dd hh:mm:ss.zzz am/pm' format.

Please see the Types topic for more information on the data types in ElevateDB and their literal representation.

TEDBEngine.SQLStrToFloat Method

```
function SQLStrToFloat(const Value: String): Double
```

Call the SQLStrToFloat method to convert a string that contains an SQL 2003 standard float constant to an actual Double value. All SQL and filter expressions in ElevateDB require standard float constants which use the period (.) as the decimal separator.

Please see the Types topic for more information on the data types in ElevateDB and their literal representation.

TEDBEngine.SQLStrToTime Method

```
function SQLStrToTime(const Value: String): TDateTime
```

Call the SQLStrToTime method to convert a string that contains an SQL 2003 standard time constant to an actual TDateTime value. All SQL and filter expressions in ElevateDB require standard time constants which use the 'hh:mm:ss.zzz am/pm' format.

Please see the Types topic for more information on the data types in ElevateDB and their literal representation.

TEDBEngine.SQLStrToYearMonthInterval Method

```
function SQLStrToYearMonthInterval(const Value: String;
      YearMonthIntervalType: TEDBYearMonthIntervalType):
      TEDBYearMonthInterval
```

Call the SQLStrToYearMonthInterval method to convert a string that contains an SQL 2003 standard year-month interval constant to an actual TEDBYearMonthInterval (Integer) value. All SQL and filter expressions in ElevateDB require standard year-month interval constants which use the 'yyyy-mm' format.

Please see the Types topic for more information on the data types in ElevateDB and their literal representation.

TEDBEngine.SubtractDateFromDateAsDayTime Method

```
function SubtractDateFromDateAsDayTime(FirstValue: TDateTime;
      SecondValue: TDateTime; DayTimeIntervalType:
      TEDBDayTimeIntervalType): TEDBDayTimeInterval
```

Call the SubtractDateFromDateAsDayTime method to subtract a date value from another date value, returning the result as a day-time interval.

Note
In ElevateDB, day-time intervals are Int64 values that represent the number of milliseconds that have elapsed between two points in time. Use the TEDBEngine DayTimeIntervalToSQLStr method to convert a day-time interval into a readable string.

TEDBEngine.SubtractDateFromDateAsYearMonth Method

```
function SubtractDateFromDateAsYearMonth(FirstValue: TDateTime;
      SecondValue: TDateTime; YearMonthIntervalType:
      TEDBYearMonthIntervalType): TEDBYearMonthInterval
```

Call the SubtractDateFromDateAsYearMonth method to subtract a date value from another date value, returning the result as a year-month interval.

Note
In ElevateDB, year-month intervals are Integer values that represent the number of days that have elapsed between two calendar days. Use the TEDBEngine YearMonthIntervalToSQLStr method to convert a year-month interval into a readable string.

TEDBEngine.SubtractDateTimeFromDateTimeAsDayTime Method

```
function SubtractDateTimeFromDateTimeAsDayTime(FirstValue:
      TDateTime; SecondValue: TDateTime; DayTimeIntervalType:
      TEDBDayTimeIntervalType): TEDBDayTimeInterval
```

Call the SubtractDateTimeFromDateTimeAsDayTime method to subtract a date-time value from another date-time value, returning the result as a day-time interval.

Note
In ElevateDB, day-time intervals are Int64 values that represent the number of milliseconds that have elapsed between two points in time. Use the TEDBEngine DayTimeIntervalToSQLStr method to convert a day-time interval into a readable string.

TEDBEngine.SubtractDayTimeFromDateTime Method

```
function SubtractDayTimeFromDateTime(Value: TDateTime;
      DayTimeInterval: TEDBDayTimeInterval; DayTimeIntervalType:
      TEDBDayTimeIntervalType): TDateTime
```

Call the SubtractDayTimeFromDateTime method to subtract a day-time interval from a date-time value and return the new date-time value.

Note
In ElevateDB, day-time intervals are Int64 values that represent the number of milliseconds that have elapsed between two points in time. Use the TEDBEngine DayTimeIntervalToSQLStr method to convert a day-time interval into a readable string.

TEDBEngine.SubtractDayTimeFromTime Method

```
function SubtractDayTimeFromTime(Value: TDateTime;
      DayTimeInterval: TEDBDayTimeInterval; DayTimeIntervalType:
      TEDBDayTimeIntervalType): TDateTime
```

Call the SubtractDayTimeFromTime method to subtract a day-time interval from a time value and return the new time value.

Note
In ElevateDB, day-time intervals are Int64 values that represent the number of milliseconds that have elapsed between two points in time. Use the TEDBEngine DayTimeIntervalToSQLStr method to convert a day-time interval into a readable string.

TEDBEngine.SubtractTimeFromTimeAsDayTime Method

```
function SubtractTimeFromTimeAsDayTime(FirstValue: TDateTime;
      SecondValue: TDateTime; DayTimeIntervalType:
      TEDBDayTimeIntervalType): TEDBDayTimeInterval
```

Call the SubtractTimeFromTimeAsDayTime method to subtract a time value from another time value, returning the result as a day-time interval.

Note
In ElevateDB, day-time intervals are Int64 values that represent the number of milliseconds that have elapsed between two points in time. Use the TEDBEngine DayTimeIntervalToSQLStr method to convert a day-time interval into a readable string.

TEDBEngine.SubtractYearMonthFromDate Method

```
function SubtractYearMonthFromDate(Value: TDateTime;
      YearMonthInterval: TEDBYearMonthInterval; YearMonthIntervalType:
      TEDBYearMonthIntervalType): TDateTime
```

Call the SubtractYearMonthFromDate method to subtract a year-month interval from a date value and return the new date value.

Note
In ElevateDB, year-month intervals are Integer values that represent the number of days that have elapsed between two calendar days. Use the TEDBEngine YearMonthIntervalToSQLStr method to convert a year-month interval into a readable string.

TEDBEngine.SubtractYearMonthFromDateTime Method

```
function SubtractYearMonthFromDateTime(Value: TDateTime;
      YearMonthInterval: TEDBYearMonthInterval; YearMonthIntervalType:
      TEDBYearMonthIntervalType): TDateTime
```

Call the SubtractYearMonthFromDateTime method to subtract a year-month interval from a date-time value and return the new date-time value.

Note
In ElevateDB, year-month intervals are Integer values that represent the number of days that have elapsed between two calendar days. Use the TEDBEngine YearMonthIntervalToSQLStr method to convert a year-month interval into a readable string.

TEDBEngine.TimeToSQLStr Method

```
function TimeToSQLStr(Value: TDateTime; MilitaryTime:
      Boolean=True): String
```

Call the TimeToSQLStr method to convert a TDateTime value to an SQL 2003 standard time constant string. All SQL and filter expressions in ElevateDB require standard time constants which use the 'hh:mm:ss.zzz am/pm' format. Use the MilitaryTime parameter to indicate whether the time should be returned in 24-hour format instead of 12-hour format with an am/pm indicator.

Please see the Types topic for more information on the data types in ElevateDB and their literal representation.

TEDBEngine.YearMonthIntervalToSQLStr Method

```
function YearMonthIntervalToSQLStr(Value: TEDBYearMonthInterval;
      YearMonthIntervalType: TEDBYearMonthIntervalType): String
```

Call the YearMonthIntervalToSQLStr method to convert a TEDBYearMonthInterval (Integer) value to an SQL 2003 standard year-month interval constant string. All SQL and filter expressions in ElevateDB require standard year-month interval constants which use the general 'yyyy-mm' format. Use the YearMonthIntervalType parameter to indicate how the year-month interval should be formatted.

Please see the Types topic for more information on the data types in ElevateDB and their literal representation.

TEDBEngine.AfterStart Event

```
property AfterStart: TNotifyEvent
```

The AfterStart event is fired right after the engine has been successfully started. Write an event handler for this event to take action at this time.

TEDBEngine.AfterStop Event

```
property AfterStop: TNotifyEvent
```

The AfterStop event is fired right after the engine has been successfully stopped. Write an event handler for this event to take action at this time.

TEDBEngine.BeforeStart Event

```
property BeforeStart: TNotifyEvent
```

The BeforeStart event is fired right before the engine is started. Write an event handler for this event to take action at this time.

TEDBEngine.BeforeStop Event

```
property BeforeStop: TNotifyEvent
```

The BeforeStop event is fired right before the engine is stopped. Write an event handler for this event to take action at this time.

TEDBEngine.OnServerProcedure Event

```
property OnServerProcedure: TEDBServerProcedureEvent
```

The OnServerProcedure event is fired when a remote session calls its CallRemoteProcedure method to call a custom server procedure and the EngineType property is set to etServer. Write an event handler for this event in order to handle such custom server procedure calls.

Warning
This event can be called from multiple threads, so any code that is called from this event handler must be thread-safe. Also, you should never destroy the instance of the TEDBServerProcedure object passed to the OnServerProcedure event. It is automatically created and destroyed for you in a thread-safe manner.

TEDBEngine.OnServerSessionEvent Event

```
property OnServerSessionEvent: TEDBServerSessionEvent
```

The OnServerSessionEvent event is fired when a remote session connects, logs in, reconnects, logs out, or disconnects from the ElevateDB Server when the EngineType property is set to etServer. Write an event handler for this event in order to track and display these activities in a visual interface for the server.

Warning
This event can be called from multiple threads, so any code that is called from this event handler must be thread-safe.

Please see the edbsrvr.dpr GUI ElevateDB Server and the edbcmd.dpr command-line ElevateDB Server projects that are provided with ElevateDB for more information on how to use this event. You can find these servers in the \servers\edbsrvr and \servers\edbcmd subdirectories under the main ElevateDB installation directory, and you can find the source code to these servers in the \source subdirectory under each server's directory.

TEDBEngine.OnServerSessionLogin Event

```
property OnServerSessionLogin: TEDBServerSessionLoginEvent
```

The OnServerSessionLogin event is fired when a remote session attempts to log in to the ElevateDB Server when the EngineType property is set to etServer. Write an event handler for this event in order to intercept all logins and perform any processing before the login, or even reject the login, if necessary. This is useful in situations where one wants to validate a session login against another authority, such as Active Directory Services in Windows.

Note
This event handler does **not** replace the normal login process, which will still occur after this event has been executed. For example, even if one validates the login information against another authority and allows the login to proceed, the login information will still need to be valid for a defined user in the ElevateDB Server's current configuration.

Warning
This event can be called from multiple threads, so any code that is called from this event handler must be thread-safe.

TEDBEngine.OnServerTrace Event

```
property OnServerTrace: TEDBServerTraceEvent
```

The OnServerTrace event is fired for every request/reply to/from the ElevateDB Server when the EngineType property is set to etServer and the ServerTrace property is set to True. Write an event handler for this event in order to log these trace events to a console debug log or a log file.

Warning
This event can be called from multiple threads, so any code that is called from this event handler must be thread-safe.

Please see the edbsrvr.dpr GUI ElevateDB Server project that is provided with ElevateDB for more information on how to use this event. You can find this server in the \servers\edbsrvr subdirectory under the main ElevateDB installation directory, and you can find the source code to this server in the \source subdirectory under the server's directory.

6.7 TEDBQuery Component

Unit: edbcomps

Inherits From TEDBDBDataSet

Use the TEDBQuery component to prepare and execute an SQL statement for a given database. When preparing and executing a SELECT statement, parameterized queries can be use to manually prepare a query once and execute it multiple times with different parameter values, which is much more efficient then preparing a different query each time.

Properties	Methods	Events
Constrained	ExecSQL	AfterPrepare
DataSource	ParamByName	AfterUnPrepare
EngineVersion	Prepare	BeforePrepare
ExecutionResult	UnPrepare	BeforeUnPrepare
ExecutionTime		OnLogMessage
ParamCheck		OnProgress
ParamCount		OnStatusMessage
Params		
Plan		
Prepared		
RequestPlan		
RequestSensitive		
RowsAffected		
Sensitive		
SQL		
StatementHandle		
StatementType		
Text		

TEDBQuery.Constrained Property

```
property Constrained: Boolean
```

Use the Constrained property to specify that no rows should be allowed to be inserted into a sensitve query result set that violate the WHERE clause of the query specified in the SQL property. This property only applies to query result sets that are sensitive to changes by other sessions, and this is indicated by the Sensitive property.

TEDBQuery.DataSource Property

```
property DataSource: TDataSource
```

The DataSource property specifies the TDataSource component from which to extract current column values to use in the identically-named parameters in the query's SQL statement specified via the SQL property. This allows you to automatically fill parameters in a query with column values from another data source. Parameters that have the same name as columns in the other data source are filled with the column values. Parameters with names that are not the same as columns in the other dataset do not automatically get values, and must be set by the application manually.

DataSource must point to a TDataSource component linked to another dataset component, meaning that it cannot point to this TEDBQuery component. The dataset specified in the TDataSource component's DataSet property must be created, populated, and opened before attempting to bind parameters. Parameters are bound by calling the Prepare method prior to executing the query using the ExecSQL or Open method. If the SQL statement used by the query does not contain parameters, or all parameters are bound by the application using the Params property or the ParamByName method, the DataSource property need not be assigned.

If the SQL statement specified in the SQL property of the TEDBQuery component is a SELECT statement, the query is executed using the new column values each time the row pointer in the other data source is changed. It is not necessary to call the Open method of the TEDBQuery component each time. This makes using the DataSource property to dynamically modify WHERE clause conditions useful for establishing master-detail relationships. Set the DataSource property in the detail query to the TDataSource component for the master data source.

Note
If the SQL statement contains parameters with the same name as columns in the other dataset, do not manually set values for these parameters. Any values manually set, either by using the Params property or the ParamByName method, will be overridden with automatic values.

TEDBQuery.EngineVersion Property

```
property EngineVersion: String
```

Indicates the current version of ElevateDB being used. This property is read-only.

TEDBQuery.ExecutionResult Property

```
property ExecutionResult: Boolean
```

The ExecutionResult property indicates the result of the execution of the current SQL statement. Currently, this only applies to the VERIFY TABLE and REPAIR TABLE SQL statements. This property will be True if any errors were found, and False if no errors were found.

TEDBQuery.ExecutionTime Property

```
property ExecutionTime: Double
```

The ExecutionTime property indicates the total time, in seconds, that the current SQL statement took to execute. This time does not include any time taken to prepare and parse the query, only the execution time itself.

TEDBQuery.ParamCheck Property

```
property ParamCheck: Boolean
```

Use the ParamCheck property to specify whether or not the Params property is cleared and regenerated if an application modifies the SQL property at runtime. By default the ParamCheck property is True, meaning that the Params property is automatically regenerated at runtime. When ParamCheck is True, the proper number of parameters is guaranteed to be generated for the current SQL statement.

Note
The TEDBQuery component always behaves like the ParamCheck property is set to True at design-time. The ParamCheck property setting is only respected at runtime.

TEDBQuery.ParamCount Property

```
property ParamCount: Integer
```

Use the ParamCount property to determine how many parameters are in the Params property. If the ParamCheck property is True, the ParamCount property always corresponds to the number of actual parameters in the SQL statement specified in the SQL property.

Note
An application can add or delete parameters to the Params property. Such additions and deletions are automatically reflected in ParamCount.

TEDBQuery.Params Property

```
property Params: TParams
```

Use the Params property to specify the parameters for an SQL statement. The Params proerty is a zero-based array of TParam objects. Index specifies the array element to access.

Note
An easier way to set and retrieve parameter values when the name of each parameter is known is to call the ParamByName method.

TEDBQuery.Plan Property

```
property Plan: TStrings
```

The Plan property is where the query plan is stored when the SQL statement specified in the SQL property is/are executed and the RequestPlan property is set to True. The Plan property is cleared before each new SQL statement specified in the SQL property is executed.

Note
Query plans are only generated for SQL SELECT, INSERT, UPDATE, or DELETE statements.

TEDBQuery.Prepared Property

```
property Prepared: Boolean
```

Use the Prepared property to determine if an SQL statement is already prepared for execution. If Prepared is True, the SQL statement is prepared, and if Prepared is False, the SQL statement is not prepared. While an SQL statement need not be prepared before execution, execution performance is enhanced if the SQL statement is prepared beforehand, particularly if it is a parameterized SQL statement that is executed more than once using different parameter values.

Note
An application can change the current setting of Prepared to prepare or unprepare an SQL statement. If Prepared is True, setting it to False calls the UnPrepare method to unprepare the SQL statement. If Prepared is False, setting it to True calls the Prepare method to prepare the SQL statement.

TEDBQuery.RequestPlan Property

```
property RequestPlan: Boolean
```

The RequestPlan property can be used to specify that a query plan be generated and stored in the Plan property when the SQL statement specified in the SQL property is executed.

Note
Query plans are only generated for SQL SELECT, INSERT, UPDATE, or DELETE statements.

TEDBQuery.RequestSensitive Property

```
property RequestSensitive: Boolean
```

Use the RequestSensitive property to specify whether or not ElevateDB should attempt to return a sensitive result set when the current SELECT statement in the SQL property is excuted. The RequestSensitive property is False by default, meaning that an insensitive and read-only result set will be returned. Set the RequestSensitive property to True and the ReadOnly property to False to request a sensitive result set that can be modified.

Note
Setting RequestSensitive to True does not guarantee that a sensitive result set will be returned by ElevateDB. A sensitive result set will be returned only if the SELECT statement syntax conforms to the syntax requirements for a sensitive result set. If the RequestSensitive property is True, but the syntax does not conform to the requirements, ElevateDB returns an insensitive result set. After executing the query, inspect the Sensitive property to determine whether the request for a sensitive result set was successful.

TEDBQuery.RowsAffected Property

```
property RowsAffected: Integer
```

Use the RowsAffected property to determine how many rows were inserted, updated or deleted by the execution of the current SQL statement specified via the SQL property. If RowsAffected is 0, the SQL statement did not insert, update or delete any rows.

Note
This property is only useful for INSERT, UPDATE, or DELETE statements and will always be equal to the RecordCount property for any SELECT statement that returns a result set.

TEDBQuery.Sensitive Property

```
property Sensitive: Boolean
```

The Sensitive property indicates whether the current SELECT statement returned a sensitive result set.

TEDBQuery.SQL Property

```
property SQL: TStrings
```

Use the SQL property to specify the SQL statement that the TEDBQuery component executes when its Open or ExecSQL methods are called.

TEDBQuery.StatementHandle Property

```
property StatementHandle: TEDBStatementManager
```

The StatementHandle property is for internal use only and is not useful to the application developer using ElevateDB.

TEDBQuery.StatementType Property

```
property StatementType: TEDBSQLStatementType
```

The StatementType property indicates the kind of SQL statement currently specified in the SQL property.

TEDBQuery.Text Property

```
property Text: String
```

The Text property indicates the actual text of the SQL statement passed to ElevateDB. For parameterized SQL statements, the Text property contains the SQL statement with parameters replaced by the parameter substitution symbol (?) in place of actual parameter values.

TEDBQuery.ExecSQL Method

```
procedure ExecSQL
```

Call the ExecSQL method to execute the SQL statement currently assigned to the SQL property. Use the ExecSQL method to execute any type of SQL statement. If the SQL statement is a SELECT statement, then the ExecSQL method will automatically call the Open method to open the query result set returned by the SELECT statement.

The ExecSQL method prepares the SQL statement in the SQL property for execution if it has not already been prepared. To speed performance in situations where an SQL statement will be executed multiple times with parameters, an application should ordinarily call the Prepare method before calling the ExecSQL method for the first time.

TEDBQuery.ParamByName Method

```
function ParamByName(const Value: String): TParam
```

Call the ParamByName method to set or access parameter information for a specific parameter based on its name. Value is the name of the parameter to access.

TEDBQuery.Prepare Method

```
procedure Prepare
```

Call the Prepare method to have ElevateDB allocate resources for the execution of an SQL statement, compile the SQL statement, and perform the process of setting up the SQL statement for execution by opening up source tables, etc. The SQL statement is specified via the SQL property.

ElevateDB automatically prepares an SQL statement if it is executed without first being prepared. After execution, ElevateDB unprepares the SQL statement. When an SQL statement will be executed a number of times, an application should always explicitly prepare the SQL statement using the Prepare method to avoid multiple and unnecessary prepares and unprepares.

Preparing a query consumes some database resources, so it is good practice for an application to unprepare a query once it is done using it. The UnPrepare method unprepares a query.

Note
When you change the SQL property, the current SQL statement is automatically closed and unprepared.

TEDBQuery.UnPrepare Method

```
procedure UnPrepare
```

Call the UnPrepare method to free the resources allocated for an SQL statement previously prepared with the Prepare method.

TEDBQuery.AfterPrepare Event

```
property AfterPrepare: TNotifyEvent
```

The AfterPrepare event is fired right after the query has been successfully prepared by calling the Prepare method or by setting the Prepared to True. Write an event handler for this event to take action at this time.

TEDBQuery.AfterUnPrepare Event

```
property AfterUnPrepare: TNotifyEvent
```

The AfterUnPrepare event is fired right after the query has been unprepared by calling the UnPrepare method or by setting the Prepared to False. Write an event handler for this event to take action at this time.

TEDBQuery.BeforePrepare Event

```
property BeforePrepare: TNotifyEvent
```

The BeforePrepare event is fired right before the query is prepared by calling the Prepare method or by setting the Prepared to True. Write an event handler for this event to take action at this time.

TEDBQuery.BeforeUnPrepare Event

```
property BeforeUnPrepare: TNotifyEvent
```

The BeforePrepare event is fired right before the query is unprepared by calling the UnPrepare method or by setting the Prepared to False. Write an event handler for this event to take action at this time.

TEDBQuery.OnLogMessage Event

```
property OnLogMessage: TEDBLogMessageEvent
```

The OnLogMessage event is fired when an SQL statement is executed via the ExecSQL or Open methods and that statement generates log messages. Assign an event handler to the OnLogMessage event to save or display these log messages within your application. The following SQL statements will generate log messages:

ALTER TABLE
VERIFY TABLE
REPAIR TABLE
OPTIMIZE TABLE

TEDBQuery.OnProgress Event

```
property OnProgress: TEDBProgressEvent
```

The OnProgress event is fired when an SQL statement is executed via the ExecSQL or Open methods and that statement generates progress. Assign an event handler to the OnProgress event to display the progress in your application and to, optionally, abort the execution of the SQL statement by setting the Continue parameter to False. The following SQL statements will generate progress:

SELECT
INSERT
UPDATE
DELETE
ALTER TABLE
VERIFY TABLE
REPAIR TABLE
OPTIMIZE TABLE
IMPORT TABLE
EXPORT TABLE
MIGRATE DATABASE
BACKUP DATABASE
RESTORE DATABASE
COMPARE DATABASE
SAVE UPDATES
LOAD UPDATES
COPY FILE
RENAME FILE
DELETE FILE

TEDBQuery.OnStatusMessage Event

```
property OnStatusMessage: TEDBStatusMessageEvent
```

The OnStatusMessage event is fired when an SQL statement is executed via the ExecSQL or Open methods and that statement generates status messages. Assign an event handler to the OnStatusMessage event to display these messages in your application. All SQL statements will generate status messages.

6.8 TEDBScript Component

Unit: edbcomps

Inherits From TEDBDBDataSet

Use the TEDBScript component to prepare and execute a script. The parameter values for the script are automatically discovered when preparing the script, and then can be assigned values to be used when the script is executed. In addition, the component can executed scripts that return result sets and the returned result set can be navigated and updated just like any other dataset.

Properties	Methods	Events
Debugging	BreakpointSet	AfterPrepare
EngineVersion	ConvertSQL	AfterUnPrepare
ExecutionTime	CopyParams	BeforePrepare
ParamCount	EndDebugScript	BeforeUnPrepare
Params	ExecScript	OnDebugCompletion
Paused	GetDebugVariable	OnDebugNotification
PauseOnExceptions	GetDebugVariableNames	OnDebugStart
Prepared	ParamByName	OnLogMessage
ScriptHandle	Pause	OnProgress
SQL	Prepare	OnStatusMessage
Stopped	RemoveBreakpoint	
	Resume	
	SetBreakpoint	
	StartDebugScript	
	StepOver	
	Stop	
	UnPrepare	

TEDBScript.Debugging Property

```
property Debugging: Boolean
```

The Debugging property is True when the threaded debug execution of a script has started by a call to the StartDebugScript method from the main thread.

Note
The script debugging functionality is primarily for use in the ElevateDB Manager, and relies on proper multi-threading techniques. It can easily result in application lock-ups and erratic behaviors if not implemented properly. You can use the debugging functionality in your own application, but please consult the ElevateDB Manager source code for more information on how to properly use this functionality.

TEDBScript.EngineVersion Property

```
property EngineVersion: String
```

Indicates the current version of ElevateDB being used. This property is read-only.

TEDBScript.ExecutionTime Property

```
property ExecutionTime: Double
```

The ExecutionTime property indicates the total time, in seconds, that the current script took to execute. This time does not include any time taken to prepare and parse the script, only the execution time itself.

TEDBScript.ParamCount Property

```
property ParamCount: Integer
```

Use the ParamCount property to determine how many parameters are in the Params property. If the Prepared property is True, the ParamCount property always corresponds to the number of actual parameters in the script specified in the SQL property.

TEDBScript.Params Property

```
property Params: TParams
```

Use the Params property to specify the parameters for a script. The Params proerty is a zero-based array of TParam objects. Index specifies the array element to access.

Note
An easier way to set and retrieve parameter values when the name of each parameter is known is to call the ParamByName method.

TEDBScript.Paused Property

```
property Paused: Boolean
```

The Paused property is True when the threaded debug execution of a script has been paused by a call to the Pause method from the main thread.

Note
The script debugging functionality is primarily for use in the ElevateDB Manager, and relies on proper multi-threading techniques. It can easily result in application lock-ups and erratic behaviors if not implemented properly. You can use the debugging functionality in your own application, but please consult the ElevateDB Manager source code for more information on how to properly use this functionality.

TEDBScript.PauseOnExceptions Property

```
property PauseOnExceptions: Boolean
```

Use the PauseOnExceptions property to indicate whether to have the threaded debug execution of a script pause when an exception is encountered in the script.

Note
The script debugging functionality is primarily for use in the ElevateDB Manager, and relies on proper multi-threading techniques. It can easily result in application lock-ups and erratic behaviors if not implemented properly. You can use the debugging functionality in your own application, but please consult the ElevateDB Manager source code for more information on how to properly use this functionality.

TEDBScript.Prepared Property

```
property Prepared: Boolean
```

Use the Prepared property to determine if a script is already prepared for execution. If Prepared is True, the script is prepared, and if Prepared is False, the script is not prepared. While a script need not be prepared before execution if it doesn't accept any parameters, it is recommended that you always prepare a script before executing it, particularly if the script accepts parameters and is executed more than once.

Note
An application can change the current setting of Prepared to prepare or unprepare a script. If Prepared is True, setting it to False calls the UnPrepare method to unprepare the script. If Prepared is False, setting it to True calls the Prepare method to prepare the script.

TEDBScript.ScriptHandle Property

```
property ScriptHandle: TEDBScriptManager
```

The ScriptHandle property is for internal use only and is not useful to the application developer using ElevateDB.

TEDBScript.SQL Property

```
property SQL: TStrings
```

Use the SQL property to specify the script that the TEDBScript component executes when its Open or ExecScript methods are called. The script must contain, at a minimum, the following SQL/PSM:

```
SCRIPT
BEGIN
END
```

TEDBScript.Stopped Property

```
property Stopped: Boolean
```

The Stopped property is True when the threaded debug execution of a script has been stopped by a call to the Stop method from the main thread.

Note
The script debugging functionality is primarily for use in the ElevateDB Manager, and relies on proper multi-threading techniques. It can easily result in application lock-ups and erratic behaviors if not implemented properly. You can use the debugging functionality in your own application, but please consult the ElevateDB Manager source code for more information on how to properly use this functionality.

TEDBScript.BreakpointSet Method

```
function BreakpointSet(LineNumber: Integer): Boolean
```

Call BreakpointSet from the main thread to determine if a breakpoint has been set for a specific line in the current script.

TEDBScript.ConvertSQL Method

```
procedure ConvertSQL(TabSize: Integer=3)
```

Call ConvertSQL to convert a series of SQL statements separated by semicolons (;) in the SQL property into a proper ElevateDB script with the following structure:

```
SCRIPT
BEGIN
END
```

The converted script is placed back into the SQL property when the conversion is complete. In the converted ElevateDB script, each statement will be enclosed within an EXECUTE IMMEDIATE statement, with the statement to be executed enclosed in single quotes ('). The TabSize parameter determines how many spaces are added in front of each EXECUTE IMMEDIATE statement in the converted script.

TEDBScript.CopyParams Method

```
procedure CopyParams(Value: TParams)
```

Call CopyParams to copy the script's parameters into a separate parameter list object. Value is the parameter list into which to assign the script's parameters. Value can be the parameter list of another script. If the script is not prepared when an application calls CopyParams, CopyParams calls Prepare before assigning the parameters to the target parameters list, and then calls UnPrepare to return the script to its previous state.

TEDBScript.EndDebugScript Method

```
function EndDebugScript: Boolean
```

Call EndDebugScript from the main thread to end the threaded debug execution of the script.

Note
The script debugging functionality is primarily for use in the ElevateDB Manager, and relies on proper multi-threading techniques. It can easily result in application lock-ups and erratic behaviors if not implemented properly. You can use the debugging functionality in your own application, but please consult the ElevateDB Manager source code for more information on how to properly use this functionality.

TEDBScript.ExecScript Method

```
procedure ExecScript
```

Call the ExecScript method to execute the script currently assigned to the SQL property. If the script returns a result set, then the ExecScript method will automatically call the Open method to open the script's result set.

The ExecScript method prepares the script in the SQL property for execution if it has not already been prepared. To speed performance in situations where a script will be executed multiple times with parameters, an application should ordinarily call the Prepare method before calling the ExecScript method for the first time.

TEDBScript.GetDebugVariable Method

```
function GetDebugVariable(const Name: String): TEDBDebugVariable
```

Call GetDebugVariable from the main thread to retrieve information about a specific script variable during the threaded debug execution of the script. You should only call GetDebugVariable when the Paused property is True.

Note
The script debugging functionality is primarily for use in the ElevateDB Manager, and relies on proper multi-threading techniques. It can easily result in application lock-ups and erratic behaviors if not implemented properly. You can use the debugging functionality in your own application, but please consult the ElevateDB Manager source code for more information on how to properly use this functionality.

TEDBScript.GetDebugVariableNames Method

```
procedure GetDebugVariableNames(List: TStrings)
```

Call GetDebugVariableNames from the main thread to retrieve a list of the current script variable names during the threaded debug execution of the script. You should only call GetDebugVariableNames when the Paused property is True.

Note
The script debugging functionality is primarily for use in the ElevateDB Manager, and relies on proper multi-threading techniques. It can easily result in application lock-ups and erratic behaviors if not implemented properly. You can use the debugging functionality in your own application, but please consult the ElevateDB Manager source code for more information on how to properly use this functionality.

TEDBScript.ParamByName Method

```
function ParamByName(const Value: String): TParam
```

Call the ParamByName method to set or access parameter information for a specific parameter based on its name. Value is the name of the parameter to access.

TEDBScript.Pause Method

```
procedure Pause
```

Call Pause from the main thread to pause the threaded debug execution of the script.

Note
The script debugging functionality is primarily for use in the ElevateDB Manager, and relies on proper multi-threading techniques. It can easily result in application lock-ups and erratic behaviors if not implemented properly. You can use the debugging functionality in your own application, but please consult the ElevateDB Manager source code for more information on how to properly use this functionality.

TEDBScript.Prepare Method

```
procedure Prepare
```

Call the Prepare method to have ElevateDB allocate resources for the execution of a script, compile the script, and perform the process of setting up the script for execution. The script is specified via the SQL property.

ElevateDB automatically prepares a script if it is executed without first being prepared. After execution, ElevateDB unprepares the script. When a script will be executed a number of times, an application should always explicitly prepare the script using the Prepare method to avoid multiple and unnecessary prepares and unprepares.

Preparing a script consumes some database resources, so it is good practice for an application to unprepare a script once it is done using it. The UnPrepare method unprepares a script.

Note
When you change the SQL property, the current script is automatically closed and unprepared.

TEDBScript.RemoveBreakpoint Method

```
function RemoveBreakpoint(LineNumber: Integer): Boolean
```

Call RemoveBreakpoint from the main thread to remove a breakpoint on a specific line from the current script.

TEDBScript.Resume Method

```
procedure Resume
```

Call Resume from the main thread to resume the threaded debug execution of the script. You should only call Resume when the Paused property is True.

Note
The script debugging functionality is primarily for use in the ElevateDB Manager, and relies on proper multi-threading techniques. It can easily result in application lock-ups and erratic behaviors if not implemented properly. You can use the debugging functionality in your own application, but please consult the ElevateDB Manager source code for more information on how to properly use this functionality.

TEDBScript.SetBreakpoint Method

```
function SetBreakpoint(LineNumber: Integer): Boolean
```

Call SetBreakpoint from the main thread to set a breakpoint on a specific line in the current script.

TEDBScript.StartDebugScript Method

```
procedure StartDebugScript
```

Call StartDebugScript from the main thread to start the threaded debug execution of the script.

Note
The script debugging functionality is primarily for use in the ElevateDB Manager, and relies on proper multi-threading techniques. It can easily result in application lock-ups and erratic behaviors if not implemented properly. You can use the debugging functionality in your own application, but please consult the ElevateDB Manager source code for more information on how to properly use this functionality.

TEDBScript.StepOver Method

```
procedure StepOver
```

Call StepOver from the main thread to step over the current line in the threaded debug execution of the script. You should only call StepOver when the Paused property is True.

Note
The script debugging functionality is primarily for use in the ElevateDB Manager, and relies on proper multi-threading techniques. It can easily result in application lock-ups and erratic behaviors if not implemented properly. You can use the debugging functionality in your own application, but please consult the ElevateDB Manager source code for more information on how to properly use this functionality.

TEDBScript.Stop Method

```
procedure Stop
```

Call Stop from the main thread to stop the threaded debug execution of the script.

Note
The script debugging functionality is primarily for use in the ElevateDB Manager, and relies on proper multi-threading techniques. It can easily result in application lock-ups and erratic behaviors if not implemented properly. You can use the debugging functionality in your own application, but please consult the ElevateDB Manager source code for more information on how to properly use this functionality.

TEDBScript.UnPrepare Method

```
procedure UnPrepare
```

Call the UnPrepare method to free the resources allocated for a script previously prepared with the Prepare method.

TEDBScript.AfterPrepare Event

```
property AfterPrepare: TNotifyEvent
```

The AfterPrepare event is fired right after the script has been successfully prepared by calling the Prepare method or by setting the Prepared to True. Write an event handler for this event to take action at this time.

TEDBScript.AfterUnPrepare Event

```
property AfterUnPrepare: TNotifyEvent
```

The AfterUnPrepare event is fired right after the script has been unprepared by calling the UnPrepare method or by setting the Prepared to False. Write an event handler for this event to take action at this time.

TEDBScript.BeforePrepare Event

```
property BeforePrepare: TNotifyEvent
```

The BeforePrepare event is fired right before the script is prepared by calling the Prepare method or by setting the Prepared to True. Write an event handler for this event to take action at this time.

TEDBScript.BeforeUnPrepare Event

```
property BeforeUnPrepare: TNotifyEvent
```

The BeforePrepare event is fired right before the script is unprepared by calling the UnPrepare method or by setting the Prepared to False. Write an event handler for this event to take action at this time.

TEDBScript.OnDebugCompletion Event

```
property OnDebugCompletion: TNotifyEvent
```

The OnDebugCompletion event is fired when the threaded debug execution of a script has completed. You can call the EndDebugScript from the main thread to end the execution.

Note
The script debugging functionality is primarily for use in the ElevateDB Manager, and relies on proper multi-threading techniques. It can easily result in application lock-ups and erratic behaviors if not implemented properly. You can use the debugging functionality in your own application, but please consult the ElevateDB Manager source code for more information on how to properly use this functionality.

TEDBScript.OnDebugNotification Event

```
property OnDebugNotification: TEDBDebugNotificationEvent
```

The OnDebugNotification event is fired when the threaded debug execution of a script has been paused, a breakpoint has been encountered, or an exception has been encountered and the PauseOnExceptions property is set to True. You can call the GetDebugVariableNames and GetDebugVariable methods from the main thread to retrieve the value of debug variables from within this event handler.

Note
The script debugging functionality is primarily for use in the ElevateDB Manager, and relies on proper multi-threading techniques. It can easily result in application lock-ups and erratic behaviors if not implemented properly. You can use the debugging functionality in your own application, but please consult the ElevateDB Manager source code for more information on how to properly use this functionality.

TEDBScript.OnDebugStart Event

```
property OnDebugStart: TNotifyEvent
```

The OnDebugStart event is fired when the threaded debug execution of a script has started by a call to the StartDebugScript method from the main thread.

Note
The script debugging functionality is primarily for use in the ElevateDB Manager, and relies on proper multi-threading techniques. It can easily result in application lock-ups and erratic behaviors if not implemented properly. You can use the debugging functionality in your own application, but please consult the ElevateDB Manager source code for more information on how to properly use this functionality.

TEDBScript.OnLogMessage Event

```
property OnLogMessage: TEDBLogMessageEvent
```

The OnLogMessage event is fired when a script is executed via the ExecScript or Open methods and that script generates log messages. Assign an event handler to the OnLogMessage event to save or display these log messages within your application.

TEDBScript.OnProgress Event

```
property OnProgress: TEDBProgressEvent
```

The OnProgress event is fired when a script is executed via the ExecScript or Open methods and that script generates progress. Assign an event handler to the OnProgress event to display the progress in your application and to, optionally, abort the execution of the script by setting the Continue parameter to False.

Note
Whether a script aborts its execution when setting the Continue parameter to False depends completely upon the script code. The script can choose to completely ignore the request to abort execution.

TEDBScript.OnStatusMessage Event

```
property OnStatusMessage: TEDBStatusMessageEvent
```

The OnStatusMessage event is fired when a script is executed via the ExecScript or Open methods and that script generates status messages. Assign an event handler to the OnStatusMessage event to display these messages in your application. All scripts will generate status messages.

6.9 TEDBServerProcedure Component

Unit: edbcomps

Inherits From TObject

Use the TEDBServerProcedure object to access the calling information for a custom server procedure in the ElevateDB Server engine. This object is passed to the TEDBEngine OnServerProcedure event in order to allow an event handler to identify which procedure is being called, get and set parameters for the procedure, and send status, log, and progress messages back to the client application.

> **Warning**
> You should never destroy the instance of the TEDBServerProcedure object passed to the OnServerProcedure event. It is automatically created and destroyed for you in a thread-safe manner.

Properties	Methods	Events
Name	Create	
Params	SendLogMessage	
	SendProgress	
	SendStatusMessage	

TEDBServerProcedure.Name Property

```
property Name: String
```

This is the name of the custom server procedure that is being called.

TEDBServerProcedure.Params Property

```
property Params: TParams
```

Use the Params property to get/set the parameters for the custom server procedure. The Params proerty is a zero-based array of TParam objects. Index specifies the array element to access.

Warning
Do not add or delete parameters, or change their name, using this property. The parameters that are sent by the calling remote session should be left as-is. Any result or output parameters required by the calling remote session will be marked as such (ptInputOutput, ptOutput, or ptResult) via their ParamType property.

TEDBServerProcedure.Create Method

```
constructor Create(ServerProcedure: TObject)
```

Call the Create constructor to create an instance of the TEDBServerProcedure class.

Note
Do not call this constructor. It is used internally by ElevateDB to create instances of the TEDBServerProcedure class for use with the TEDBEngine OnServerProcedure event.

TEDBServerProcedure.SendLogMessage Method

```
procedure SendLogMessage(const LogMsg: String)
```

Use this method to send a log message back to the calling remote session. This message will appear via the calling remote session's OnLogMessage event handler.

TEDBServerProcedure.SendProgress Method

```
procedure SendProgress(PercentDone: Integer; var Continue:
      Boolean)
```

Use this method to send progress back to the calling remote session. The progress will appear via the calling remote session's OnProgress event handler.

Note
If the remote session does not want to continue with the custom server procedure, it will set the Continue property to False. It is completely up to the custom server procedure as to whether it respects this setting or not. Certain types of custom server procedures will not be interruptable, and should ignore this parameter.

TEDBServerProcedure.SendStatusMessage Method

```
procedure SendStatusMessage(const StatusMsg: String)
```

Use this method to send a status message back to the calling remote session. This message will appear via the calling remote session's OnStatusMessage event handler.

6.10 TEDBSession Component

Unit: edbcomps

Inherits From TComponent

Use the TEDBSession component to manage a local or remote session within an application. A session acts like a "virtual user" and each new session component used in an application maintains its own database connections, table buffers, table/view/query result set cursors, etc. Because of the unique requirements of a multi-threaded application, ElevateDB requires that you use a separate TEDBSession component for each thread in use, thus treating each thread as a separate "virtual user".

A default TEDBSession component is created automatically when the application is started and can be referenced via the global Session function in the edbcomps unit.

> **Note**
> Applications that maintain multiple sessions can manage them through the TEDBEngine component. A TEDBEngine component is created automatically when an application is started and can be referenced via the global Engine function in the edbcomps unit.

Properties	Methods	Events
AutoSessionName	CalculateCRC32ForStream	AfterConnect
CharacterSet	CallRemoteProcedure	AfterDisconnect
Connected	Close	BeforeConnect
CurrentRemoteID	CloseDatabase	BeforeDisconnect
CurrentUser	Create	OnLogin
DatabaseCount	DropConnections	OnLogMessage
Databases	Execute	OnProgress
EngineVersion	ExecuteScript	OnRemoteReceiveProgress
ExcludeFromLicensedSessions	FindDatabase	OnRemoteReconnect
ForceBufferFlush	FreeCachedFuncProcs	OnRemoteSendProgress
FuncProcCacheSize	FreeCachedSQLStmts	OnRemoteTimeout
Handle	GetDatabaseNames	OnRemoteTrace
KeepConnections	GetDatabases	OnStatusMessage
KeepTablesOpen	GetRemoteDateTime	
LocalBackupExtension	GetRemoteServerDescription	
LocalCacheModules	GetRemoteServerName	
LocalCatalogExtension	GetRemoteServerVersion	
LocalCatalogName	GetRemoteUTCDateTime	

LocalConfigExtension	GetStoredProcNames	
LocalConfigMemory	GetTableNames	
LocalConfigName	Open	
LocalConfigPath	OpenDatabase	
LocalEncryptionPassword	SaveStoreFileToStream	
LocalLockExtension	SaveStreamToStoreFile	
LocalLogCategories		
LocalLogExtension		
LocalMaxLogFileSize		
LocalShowDatabaseCatalogInfo		
LocalShowUserPasswords		
LocalSignature		
LocalTableBlobExtension		
LocalTableExtension		
LocalTableIndexExtension		
LocalTablePublishExtension		
LocalTempTablesPath		
LocalUpdateExtension		
LoginPassword		
LoginUser		
ProgressTimeInterval		
RecordChangeDetection		
RecordLockProtocol		
RecordLockRetryCount		
RecordLockWaitTime		
RemoteAddress		
RemoteCompression		
RemoteConnectionTimeout		
RemoteEncryption		
RemoteEncryptionPassword		
RemoteHost		
RemoteParams		
RemotePing		
RemotePingInterval		
RemotePort		
RemoteService		

RemoteSignature		
RemoteTimeout		
RemoteTrace		
SessionDescription		
SessionName		
SessionType		
SQLStmtCacheSize		

TEDBSession.AutoSessionName Property

```
property AutoSessionName: Boolean
```

Use the AutoSessionName property to specify whether or not a unique session name is automatically generated for the TEDBSession component. AutoSessionName is intended to guarantee developers of multi-threaded applications that TEDBSession components created for each thread are assigned unique names at runtime.

When AutoSessionName is False (the default), the application must set the SessionName property for a session component to a unique name within the context of the application. When AutoSessionName is True, the TEDBSession component assigns the SessionName property automatically and replicates this session name across the SessionName properties of all TEDBDatabase, TEDBQuery, TEDBTable, and TEDBStoredProc components in the data module or form where the session component is created. This allows applications to use TEDBSession components in data modules that are replicated over multiple threads without having to worry about providing unique names for each session when the data module is created. The TEDBSession component constructs a session name by taking the current value of the Name property and appending an underscore (_) followed by a numeric value. For example, if the Name property was set to "CustomerSession", then the AutoSessionName property would be set to "CustomerSession_2" for the second session created.

Note
The following restrictions apply to the AutoSessionName property:

- You cannot set the AutoSessionName property to True for a TEDBSession component in a data module or form that contains more than one TEDBSession component.

- You cannot add a TEDBSession component to a data module or form that already contains a TEDBSession component with its AutoSessionName property set to True.

- You cannot directly set the SessionName property of a TEDBSession component when its AutoSessionName property is True.

TEDBSession.CharacterSet Property

```
property CharacterSet: TEDBCharacterSet
```

Use the CharacterSet property to specify the character set to use with the session. The character set must match the character set of the configuration being accessed for local sessions, or the ElevateDB Server's configuration for remote sessions.

Note
The default value for this property is inherited from the TEDBEngine CharacterSet property.

TEDBSession.Connected Property

```
property Connected: Boolean
```

Use the Connected property to connect or disconnect a session. Setting Connected to True connects the session, triggering the BeforeConnect event before connecting and the AfterConnect event after successfully connecting. If the SessionType property is set to stRemote, then ElevateDB will attempt to connect to the ElevateDB Server specified by the RemoteHost or RemoteAddressand RemotePort or RemoteService properties. If the session can successfully connect to the ElevateDB Server, it will then automatically login to the server using the LoginUser and LoginPasword properties. If the SessionType property is set to stLocal, then ElevateDB will connect the session and then automatically login to the configuration specified via the TEDBEngine ConfigPath property, using the LoginUser and LoginPasword properties.

Setting Active to False closes any open datasets, and disconnects active database connections. If the SessionType property is set to stRemote, then the connection to the ElevateDB Server is closed and the user is logged out. If the SessionType property is set to stLocal, then the user is simply logged out.

TEDBSession.CurrentRemoteID Property

```
property CurrentRemoteID: Integer
```

Indicates the ID of the session that is currently logged in to the ElevateDB Server when the SessionType property is set to stRemote.

TEDBSession.CurrentUser Property

```
property CurrentUser: String
```

Indicates the user name of the session that is currently logged in. If the session is not connected or logged in, then this property returns an empty string ('').

TEDBSession.DatabaseCount Property

```
property DatabaseCount: Integer
```

Indicates the number of active TEDBDatabase components currently associated with the session. This number can change as TEDBDatabase components are opened and closed. If the DatabaseCount property is zero, there are currently no active TEDBDatabase components associated with the session.

DatabaseCount is typically used with the Databases property to iterate through the current set of active TEDBDatabase components in a session.

TEDBSession.Databases Property

```
property Databases[Index: Integer]: TEDBDatabase
```

Use the Databases property to access active TEDBDatabase components associated with a session. An active TEDBDatabase component is one that has its Connected property set to True.

The Databases property is typically used with the DatabaseCount property to iterate through the current set of active TEDBDatabase components in a session.

TEDBSession.EngineVersion Property

```
property EngineVersion: String
```

Indicates the current version of ElevateDB being used. This property is read-only.

TEDBSession.ExcludeFromLicensedSessions Property

```
property ExcludeFromLicensedSessions: Boolean
```

Use the ExcludeFromLicensedSessions property to exclude the current session from the total licensed session count specified by the TEDBEngine LicensedSessions property for local sessions, and the licensed session count configured for the ElevateDB Server for remote sessions.

TEDBSession.ForceBufferFlush Property

```
property ForceBufferFlush: Boolean
```

Use the ForceBufferFlush property to specify that the all TEDBTable, TEDBQuery, and TEDBStoredProc components in this session should automatically force the operating system to flush any cached writes to disk after ElevateDB has written any data using operating system calls. This can significantly reduce instances of corruption in the event of an improper application shutdown, however it can also cause performance degradation for large updates, repairing tables, etc. A better alternative for reducing the performance implications of this property is to use the FlushBuffers method of the TEDBTable, TEDBQuery, or TEDBStoredProc components to selectively flush the cached operating system writes to disk as necessary.

TEDBSession.FuncProcCacheSize Property

```
property FuncProcCacheSize: Integer
```

Use the FuncProcCacheSize property to specify how many functions/procedures can be cached in memory for the duration of the session. Caching functions/procedures improves the performance of ElevateDB by avoiding very expensive preparation/un-preparation cycles. The default value is 0, which means that functions/procedures will not be cached for the session.

Note
The maximum number of open functions/procedures per connection is 2048, so you should not set the function/procedure cache size that high. Also, the function/procedure cache size is a **per-open-database** setting.

TEDBSession.Handle Property

```
property Handle: TEDBSessionManager
```

The Handle property is for internal use only and is not useful to the application developer using ElevateDB.

TEDBSession.KeepConnections Property

```
property KeepConnections: Boolean
```

Use the KeepConnections property to specify whether or not a temporary TEDBDatabase component created in the context of a session maintains a database connection even if there are no active TEDBTable, TEDBQuery, or TEDBStoredProc components associated with the TEDBDatabase component. If the KeepConnections property is True (the default), the application maintains TEDBDatabase connections until the application exits or calls the DropConnections method. For remote sessions, the KeepConnections property should remain True to reduce network traffic and avoid constantly opening and closing databases.

When the KeepConnections property is False, an application disconnects from a database when all TEDBTable, TEDBQuery, and TEDBStoredProc components associated with a TEDBDatabase component are closed. Dropping a connection releases system resources allocated to the connection, but if a dataset is later reopened that uses the same database, the connection must be reestablished and initialized.

Note
The duration of a connection for a persistent, not temporary, TEDBDatabase component is determined by the TEDBDatabase component's KeepConnection property instead of the session's KeepConnections property.

TEDBSession.KeepTablesOpen Property

```
property KeepTablesOpen: Boolean
```

Use the KeepTablesOpen property to specify that any tables opened are kept open internally in ElevateDB, even though they have been closed by the application. These tables are kept open internally until the session is disconnected and the Connected property is False. This can result in significant performance improvements in situations where ElevateDB must open and close the same set of tables frequently, such as with SQL statements.

TEDBSession.LocalBackupExtension Property

```
property LocalBackupExtension: String
```

This property overrides the TEDBEngine BackupExtension property when the TEDBSession SessionType property is set to stLocal and the TEDBEngine UseLocalSessionEngineSettings property is set to True.

Note
The value of this property is initially set to the corresponding TEDBEngine property value when the TEDBSession component is first created.

TEDBSession.LocalCacheModules Property

```
property LocalCacheModules: Boolean
```

This property overrides the TEDBEngine CacheModules property when the TEDBSession SessionType property is set to stLocal and the TEDBEngine UseLocalSessionEngineSettings property is set to True.

Note
The value of this property is initially set to the corresponding TEDBEngine property value when the TEDBSession component is first created.

TEDBSession.LocalCatalogExtension Property

```
property LocalCatalogExtension: String
```

This property overrides the TEDBEngine CatalogExtension property when the TEDBSession SessionType property is set to stLocal and the TEDBEngine UseLocalSessionEngineSettings property is set to True.

Note
The value of this property is initially set to the corresponding TEDBEngine property value when the TEDBSession component is first created.

TEDBSession.LocalCatalogName Property

```
property LocalCatalogName: String
```

This property overrides the TEDBEngine CatalogName property when the TEDBSession SessionType property is set to stLocal and the TEDBEngine UseLocalSessionEngineSettings property is set to True.

Note
The value of this property is initially set to the corresponding TEDBEngine property value when the TEDBSession component is first created.

TEDBSession.LocalConfigExtension Property

```
property LocalConfigExtension: String
```

This property overrides the TEDBEngine ConfigExtension property when the TEDBSession SessionType property is set to stLocal and the TEDBEngine UseLocalSessionEngineSettings property is set to True.

Note
The value of this property is initially set to the corresponding TEDBEngine property value when the TEDBSession component is first created.

TEDBSession.LocalConfigMemory Property

```
property LocalConfigMemory: Boolean
```

This property overrides the TEDBEngine ConfigMemory property when the TEDBSession SessionType property is set to stLocal and the TEDBEngine UseLocalSessionEngineSettings property is set to True.

Note
The value of this property is initially set to the corresponding TEDBEngine property value when the TEDBSession component is first created.

TEDBSession.LocalConfigName Property

```
property LocalConfigName: String
```

This property overrides the TEDBEngine ConfigName property when the TEDBSession SessionType property is set to stLocal and the TEDBEngine UseLocalSessionEngineSettings property is set to True.

Note
The value of this property is initially set to the corresponding TEDBEngine property value when the TEDBSession component is first created.

TEDBSession.LocalConfigPath Property

```
property LocalConfigPath: String
```

This property overrides the TEDBEngine ConfigPath property when the TEDBSession SessionType property is set to stLocal and the TEDBEngine UseLocalSessionEngineSettings property is set to True.

Note
The value of this property is initially set to the corresponding TEDBEngine property value when the TEDBSession component is first created.

TEDBSession.LocalEncryptionPassword Property

```
property LocalEncryptionPassword: String
```

This property overrides the TEDBEngine EncryptionPassword property when the TEDBSession SessionType property is set to stLocal and the TEDBEngine UseLocalSessionEngineSettings property is set to True.

Note
The value of this property is initially set to the corresponding TEDBEngine property value when the TEDBSession component is first created.

TEDBSession.LocalLockExtension Property

```
property LocalLockExtension: String
```

This property overrides the TEDBEngine LockExtension property when the TEDBSession SessionType property is set to stLocal and the TEDBEngine UseLocalSessionEngineSettings property is set to True.

Note
The value of this property is initially set to the corresponding TEDBEngine property value when the TEDBSession component is first created.

TEDBSession.LocalLogCategories Property

```
property LocalLogCategories: TEDBLogCategories
```

This property overrides the TEDBEngine LogCategories property when the TEDBSession SessionType property is set to stLocal and the TEDBEngine UseLocalSessionEngineSettings property is set to True.

Note
The value of this property is initially set to the corresponding TEDBEngine property value when the TEDBSession component is first created.

TEDBSession.LocalLogExtension Property

```
property LocalLogExtension: String
```

This property overrides the TEDBEngine LogExtension property when the TEDBSession SessionType property is set to stLocal and the TEDBEngine UseLocalSessionEngineSettings property is set to True.

Note
The value of this property is initially set to the corresponding TEDBEngine property value when the TEDBSession component is first created.

TEDBSession.LocalMaxLogFileSize Property

```
property LocalMaxLogFileSize: Integer
```

This property overrides the TEDBEngine MaxLogFileSize property when the TEDBSession SessionType property is set to stLocal and the TEDBEngine UseLocalSessionEngineSettings property is set to True.

Note
The value of this property is initially set to the corresponding TEDBEngine property value when the TEDBSession component is first created.

TEDBSession.LocalShowDatabaseCatalogInfo Property

```
property LocalShowDatabaseCatalogInfo: Boolean
```

This property overrides the TEDBEngine ShowDatabaseCatalogInfo property when the TEDBSession SessionType property is set to stLocal and the TEDBEngine UseLocalSessionEngineSettings property is set to True.

Note
The value of this property is initially set to the corresponding TEDBEngine property value when the TEDBSession component is first created.

TEDBSession.LocalShowUserPasswords Property

```
property LocalShowUserPasswords: Boolean
```

This property overrides the TEDBEngine ShowUserPasswords property when the TEDBSession SessionType property is set to stLocal and the TEDBEngine UseLocalSessionEngineSettings property is set to True.

Note
The value of this property is initially set to the corresponding TEDBEngine property value when the TEDBSession component is first created.

TEDBSession.LocalSignature Property

```
property LocalSignature: String
```

This property overrides the TEDBEngine Signature property when the TEDBSession SessionType property is set to stLocal and the TEDBEngine UseLocalSessionEngineSettings property is set to True.

Note
The value of this property is initially set to the corresponding TEDBEngine property value when the TEDBSession component is first created.

TEDBSession.LocalTableBlobExtension Property

```
property LocalTableBlobExtension: String
```

This property overrides the TEDBEngine TableBlobExtension property when the TEDBSession SessionType property is set to stLocal and the TEDBEngine UseLocalSessionEngineSettings property is set to True.

Note
The value of this property is initially set to the corresponding TEDBEngine property value when the TEDBSession component is first created.

TEDBSession.LocalTableExtension Property

```
property LocalTableExtension: String
```

This property overrides the TEDBEngine TableExtension property when the TEDBSession SessionType property is set to stLocal and the TEDBEngine UseLocalSessionEngineSettings property is set to True.

Note
The value of this property is initially set to the corresponding TEDBEngine property value when the TEDBSession component is first created.

TEDBSession.LocalTableIndexExtension Property

```
property LocalTableIndexExtension: String
```

This property overrides the TEDBEngine TableIndexExtension property when the TEDBSession SessionType property is set to stLocal and the TEDBEngine UseLocalSessionEngineSettings property is set to True.

Note
The value of this property is initially set to the corresponding TEDBEngine property value when the TEDBSession component is first created.

TEDBSession.LocalTablePublishExtension Property

```
property LocalTablePublishExtension: String
```

This property overrides the TEDBEngine TablePublishExtension property when the TEDBSession SessionType property is set to stLocal and the TEDBEngine UseLocalSessionEngineSettings property is set to True.

Note
The value of this property is initially set to the corresponding TEDBEngine property value when the TEDBSession component is first created.

TEDBSession.LocalTempTablesPath Property

```
property LocalTempTablesPath: String
```

This property overrides the TEDBEngine TempTablesPath property when the TEDBSession SessionType property is set to stLocal and the TEDBEngine UseLocalSessionEngineSettings property is set to True.

Note
The value of this property is initially set to the corresponding TEDBEngine property value when the TEDBSession component is first created.

TEDBSession.LocalUpdateExtension Property

```
property LocalUpdateExtension: String
```

This property overrides the TEDBEngine UpdateExtension property when the TEDBSession SessionType property is set to stLocal and the TEDBEngine UseLocalSessionEngineSettings property is set to True.

Note
The value of this property is initially set to the corresponding TEDBEngine property value when the TEDBSession component is first created.

TEDBSession.LoginPassword Property

```
property LoginPassword: String
```

Use the LoginPassword property to specify the password for automating the login of a session. When the session is opened via the Open method or by setting the Connected property to True, ElevateDB will attempt to connect the session and then automatically login the user specified by the LoginUser and LoginPassword properties. If for any reason these properties are not set correctly then the OnLogin event will be triggered. If an event handler is not assigned to the OnLogin event then a login dialog will be displayed in order to prompt the user for a user name and password.

TEDBSession.LoginUser Property

```
property LoginUser: String
```

Use the LoginUser property to specify the user name for automating the login of a session. When the session is opened via the Open method or by setting the Connected property to True, ElevateDB will attempt to connect the session and then automatically login the user specified by the LoginUser and LoginPassword properties. If for any reason these properties are not set correctly then the OnLogin event will be triggered. If an event handler is not assigned to the OnLogin event then a login dialog will be displayed in order to prompt the user for a user name and password.

TEDBSession.ProgressTimeInterval Property

```
property ProgressTimeInterval: Integer
```

Use the ProgressTimeInterval property to specify the amount of time, in milliseconds, that must elapse between progress updates before ElevateDB will generate a progress event. The default value is 1000 milliseconds, or 1 second.

TEDBSession.RecordChangeDetection Property

```
property RecordChangeDetection: Boolean
```

Use the RecordChangeDetection property to specify whether the session will detect changes to a row during editing or deletion and issue an error if the row has changed since it was last cached. Please see the Change Detection topic for more information. The default value is False.

TEDBSession.RecordLockProtocol Property

```
property RecordLockProtocol: TEDBRecordLockProtocol
```

Use the RecordLockProtocol property to specify whether the session will use a pessimistic or optimistic row locking model when editing records via navigational methods or SQL statements. The pessimistic row locking model dictates that a row should be locked when the row is retrieved for editing, which is during the Edit method of a TEDBTable, TEDBQuery, or TEDBStoredProc component and during the execution of an UPDATE statement. The optimistic row locking model dictates that a row should be locked when the row modifications are posted to the table, which is during the Post method of a TEDBTable, TEDBQuery , or TEDBStoredProc component and during the execution of an UPDATE statement. Using an optimistic row locking model for remote connections to an ElevateDB Server removes the possibility that dangling row locks will be left on the server if a client application is terminated unexpectedly.

The default value is lpPessimistic.

TEDBSession.RecordLockRetryCount Property

```
property RecordLockRetryCount: Integer
```

Use the RecordLockRetryCount property to specify the number of times ElevateDB will retry a row lock before raising a row lock exception. The amount of time between each row lock retry is controlled by the RecordLockWaitTime property of the TEDBSession component.

Note
This property only affects datasets (TEDBTable, TEDBQuery, or TEDBStoredProc components) attached to this TEDBSession component via their SessionName property.

TEDBSession.RecordLockWaitTime Property

```
property RecordLockWaitTime: Integer
```

Use the RecordLockWaitTime property to specify the amount of time, in milliseconds, ElevateDB will wait between retries of a row lock. The number of times that a row lock is retried is controlled by the RecordLockRetryCount property of the TEDBSession component.

Note
This property only affects datasets (TEDBTable, TEDBQuery, or TEDBStoredProc components) attached to this TEDBSession component via their SessionName property.

TEDBSession.RemoteAddress Property

```
property RemoteAddress: String
```

Use the RemoteAddress property to specify the IP address of an ElevateDB Server that you wish to connect to. This property only applies to remote sessions where the SessionType property is set to stRemote. When the session is opened via the Open method or by setting the Connected property to True, ElevateDB will attempt to connect to the ElevateDB Server specified by the RemoteAddress or RemoteHost and RemotePort or RemoteService properties.

TEDBSession.RemoteCompression Property

```
property RemoteCompression: Integer
```

Use the RemoteCompression property to set the level of compression used for a remote session. This property only applies to remote sessions where the SessionType property is set to stRemote. The compression is specified as a value between 0 and 9, with the default being 0, or none, and 6 being the best selection for size/speed.

Note
This property can be changed while the session is connected so that you may adjust the level of compression for individual situations.

TEDBSession.RemoteConnectionTimeout Property

```
property RemoteConnectionTimeout: Integer
```

Use the RemoteConnectionTimeout property to specify the maximum amount of time, in seconds, that the remote session will wait for a successful connection before aborting the connection attempt. The default value is 15 seconds.

TEDBSession.RemoteEncryption Property

```
property RemoteEncryption: Boolean
```

Use the RemoteEncryption property to specify that a remote session will be encrypted using the RemoteEncryptionPassword property. This property only applies to remote sessions where the SessionType property is set to stRemote.

Note
This property must be set prior to connecting the session to the ElevateDB Server via the Open method or the Connected property.

TEDBSession.RemoteEncryptionPassword Property

```
property RemoteEncryptionPassword: String
```

Use the RemoteEncryptionPassword property to specify the password that a remote session will be encrypted with when the RemoteEncryption property is set to True. However, even if the RemoteEncryption property is set to False, the RemoteEncryptionPassword property will be used to encrypt any login information sent to the ElevateDB Server, so the RemoteEncryptionPassword must always match the corresponding server encryption password for session communciations or logins will be unsuccessful. This property only applies to remote sessions where the SessionType property is set to stRemote.

Note
This property must be set prior to connecting the session to the ElevateDB Server via the Open method or the Connected property.

TEDBSession.RemoteHost Property

```
property RemoteHost: String
```

Use the RemoteHost property to specify the host name of an ElevateDB Server that you wish to connect to. A host name is alternate way of specifying a remote IP address by relying on DNS to translate the host name into a usable IP address. This property only applies to remote sessions where the SessionType property is set to stRemote. When the session is opened via the Open method or by setting the Connected property to True, ElevateDB will attempt to connect to the ElevateDB Server specified by the RemoteAddress or RemoteHost and RemotePort or RemoteService properties.

TEDBSession.RemoteParams Property

```
property RemoteParams: TParams
```

This property is used with the CallRemoteProcedure method to call custom server procedures added to the ElevateDB Server engine. This property only applies to remote sessions where the SessionType property is set to stRemote.

Note
The parameters that are sent along with the custom server procedure call are completely user-defined. It is up to the calling remote session to define all necessary parameters, including output or result parameters for getting data back from the custom server procedure.

TEDBSession.RemotePing Property

```
property RemotePing: Boolean
```

Use the RemotePing property to enable or disable pinging to an ElevateDB Server. Pinging the server allows for the use of a smaller dead session expiration time on the server and can be used to prevent dangling locks when a client workstation shuts down and leaves an open session on the server.

The default value is True.

When the RemotePing property is set to True, the remote session will ping the server according to the interval in seconds specified by the RemotePingInterval property. This property only applies to remote sessions where the SessionType property is set to stRemote.

TEDBSession.RemotePingInterval Property

```
property RemotePingInterval: Integer
```

Use the RemotePingInterval property to specify the interval in seconds between pings to an ElevateDB Server when the RemotePing property is set to True. This property only applies to remote sessions where the SessionType property is set to stRemote.

TEDBSession.RemotePort Property

```
property RemotePort: Integer
```

Use the RemotePort property to specify the port of an ElevateDB Server that you wish to connect to. This property only applies to remote sessions where the SessionType property is set to stRemote. When the session is opened via the Open method or by setting the Connected property to True, ElevateDB will attempt to connect to the ElevateDB Server specified by the RemoteAddress or RemoteHost and RemotePort or RemoteService properties.

TEDBSession.RemoteService Property

```
property RemoteService: String
```

Use the RemoteService property to specify the service name of an ElevateDB Server that you wish to connect to. A service name is an alternate way of specifying a remote port using a standard name instead of a port number. This property only applies to remote sessions where the SessionType property is set to stRemote. When the session is opened via the Open method or by setting the Connected property to True, ElevateDB will attempt to connect to the server specified by the RemoteAddress or RemoteHost and RemotePort or RemoteService properties.

TEDBSession.RemoteSignature Property

```
property RemoteSignature: String
```

Use the RemoteSignature property to specify the signature that a remote session will be signed with. This property only applies to remote sessions where the SessionType property is set to stRemote.

Note
This property must be set prior to connecting the session to the ElevateDB Server via the Open method or the Connected property.

TEDBSession.RemoteTimeout Property

```
property RemoteTimeout: Integer
```

Use the RemoteTimeout property to specify the amount of time, in seconds, that a remote session should wait for a response from an ElevateDB Server before firing the OnRemoteTimeout event. If the OnRemoteTimeout event is assigned an event handler, then the event handler can decide whether to disconnect the session or not. If the OnRemoteTimeout event is not assigned an event handler, then ElevateDB will disconnect the session. This property only applies to remote sessions where the SessionType property is set to stRemote.

Note
Just because the session disconnects its side of the connection with the server does not necessarily mean that the server knows the session is disconnected or immediately treats the session as a "dead" session. The server may just simply be executing a very long process and has not sent a progress message in a longer period of time than what is configured for the RemoteTimeout property. Please see the Configuring and Starting the Engine topic for more information on the meaning of "dead" sessions on an ElevateDB Server.

TEDBSession.RemoteTrace Property

```
property RemoteTrace: Boolean
```

Use the RemoteTrace property to enable or disable tracing of all requests sent to and responses received from an ElevateDB Server. When the RemoteTrace property is set to True, the OnRemoteTrace event is fired whenever a request is sent to or a response is received from the server. This can be useful in debugging performance issues with a connection. This property only applies to remote sessions where the SessionType property is set to stRemote.

TEDBSession.SessionDescription Property

```
property SessionDescription: String
```

Use the SessionDescription property to specify a description for the session. This description is used to further identify the session in logged events involving the session or in session events on an ElevateDB Server.

TEDBSession.SessionName Property

```
property SessionName: String
```

Use the SessionName property to specify a unique session name that can be used by TEDBDatabase, TEDBTable, TEDBQuery, and TEDBStoredProc components to link to this session via their own SessionName properties, which must either match the SessionName property of an active session or be blank, indicating that they should be associated with the default global TEDBSession component that is created automatically when the application is started and can be referenced via the global Session function in the edbcomps unit.

Note
If the AutoSessionName property is True, an application cannot set the SessionName property directly.

TEDBSession.SessionType Property

```
property SessionType: TEDBSessionType
```

Use the SessionType property to specify the type of session represented by the session component. Setting this property to stLocal (the default) will cause ElevateDB to access all databases and tables in the session directly using operating system calls. Setting this property to stRemote will cause ElevateDB to access all databases and tables in the session remotely through the ElevateDB Server specified by the RemoteAddress or RemoteHost and RemotePort or RemoteService properties.

Note
This property must be set prior to starting the session via the Open method or the Connected property.

TEDBSession.SQLStmtCacheSize Property

```
property SQLStmtCacheSize: Integer
```

Use the SQLStmtCacheSize property to specify how many SQL statements can be cached in memory for the duration of the session. Caching SQL statements improves the performance of ElevateDB by avoiding very expensive preparation/un-preparation cycles. The default value is 0, which means that SQL statements will not be cached for the session.

Note
The maximum number of open SQL statements per connection is 2048, so you should not set the statement cache size that high. Also, the SQL statement cache size is a **per-open-database** setting.

TEDBSession.CalculateCRC32ForStream Method

```
function CalculateCRC32ForStream(Stream: TStream): TEDBLongWord
```

Use the CalculateCRC32ForStream method to calculate the CRC32 checksum value for any stream. This is useful for detecting changes to a given stream when used with the SaveStoreFileToStream and SaveStreamToStoreFile methods for loading and then saving a store file to and from a stream. For more information, please see the Stores topic in the ElevateDB SQL Manual.

TEDBSession.CallRemoteProcedure Method

```
procedure CallRemoteProcedure(const NameOfProcedure: String)
```

Use the CallRemoteProcedure method along with the RemoteParams property to call a custom server procedure in the ElevateDB Server engine.

Note
The parameters that are sent along with the custom server procedure call are completely user-defined. It is up to the calling remote session to define all necessary parameters, including output or result parameters for getting data back from the custom server procedure.

TEDBSession.Close Method

```
procedure Close
```

Call the Close method to close the session and disconnect from an ElevateDB Server if the SessionType property is set to stRemote. The Close method disconnects all active TEDBDatabase components that are linked to the session via their SessionName property, which in turn closes all TEDBTable, TEDBQuery, and TEDBStoredProc components linked to these databases.

Note
Setting the Connected property to False also closes a session.

TEDBSession.CloseDatabase Method

```
procedure CloseDatabase(Database: TEDBDatabase)
```

Call the CloseDatabase method to close a TEDBDatabase component linked to the current session. The Database parameter specifies TEDBDatabase component that you wish to close.

The CloseDatabase method decrements the specified TEDBDatabase component's reference count and then, if the reference count is zero and the TEDBDatabase component's KeepConnection property is False, closes the TEDBDatabase component.

TEDBSession.Create Method

```
constructor Create(AOwner: TComponent)
```

Call the Create constructor to create an instance of the TEDBSession component.

TEDBSession.DropConnections Method

```
procedure DropConnections
```

Call the DropConnections method to free all temporary TEDBDatabase components for the session that are inactive. If the KeepConnections property of the session is True (the default), then temporary TEDBDatabase components created as needed for the session by ElevateDB at runtime are not automatically freed when their database connections are closed. DropConnections enables an application to free these TEDBDatabase components when they are no longer needed.

TEDBSession.Execute Method

```
function Execute(const SQL: String; Params: TParams=nil; Query:
      TEDBQuery=nil): Integer
```

Call the Execute method to execute an SQL statement directly. The number of rows affected is returned as the result of this method. The SQL statement may also be parameterized. Any SQL statement executed using this method is automatically executed from the context of the system-created Configuration database. This makes this method ideal for creating objects in the Configuration database.

Note
You may pass in a TEDBQuery component that has already been created for use with this method. However, in such a case you should be aware that several properties of the TEDBQuery component will be overwritten by this method in order to execute the SQL.

TEDBSession.ExecuteScript Method

```
procedure ExecuteScript(const SQL: String; Params: TParams=nil;
      Script: TEDBScript=nil)
```

Call the ExecuteScript method to execute an SQL script directly. The SQL script may also be parameterized. Any SQL script executed using this method is automatically executed from the context of the system-created Configuration database. This makes this method ideal for working with the Configuration database.

Note
You may pass in a TEDBScript component that has already been created for use with this method. However, in such a case you should be aware that several properties of the TEDBScript component will be overwritten by this method in order to execute the script.

TEDBSession.FindDatabase Method

```
function FindDatabase(const DatabaseName: String): TEDBDatabase
```

Call the FindDatabase method to searches a session's list of TEDBDatabase components for a specified database. The DatabaseName parameter specifies the name of the TEDBDatabase component to search for. The FindDatabase method compares the DatabaseName parameter to the DatabaseName property for each TEDBDatabase component linked to the session via its SessionName property. If a match is found, the FindDatabase method returns a reference to the TEDBDatabase component. Otherwise the FindDatabase method returns nil.

TEDBSession.FreeCachedFuncProcs Method

```
procedure FreeCachedFuncProcs(const DatabaseName: String)
```

Frees any cached functions/procedures for the specified open database. If a database is not specified, then any cached functions/procedures in the open databases for the session will be freed.

TEDBSession.FreeCachedSQLStmts Method

```
procedure FreeCachedSQLStmts(const DatabaseName: String)
```

Frees any cached SQL statements for the specified open database. If a database is not specified, then any cached SQL statements in the open databases for the session will be freed.

TEDBSession.GetDatabaseNames Method

```
procedure GetDatabaseNames(List: TStrings)
```

Call the GetDatabaseNames method to populate a string list with the names of all TEDBDatabase components linked to the session via their SessionName property. List is a string list object, created and maintained by the application, into which to store the database names.

Note
This method is not the same as the GetDatabases method, which returns a list of databases defined in the configuration file pointed to by the TEDBEngine ConfigPath property for local sessions, or the list of databases defined on the ElevateDB Server for remote sessions.

TEDBSession.GetDatabases Method

```
procedure GetDatabases(List: TStrings)
```

Call the GetDatabases method to populate a string list with the names of all databases defined in the configuration file pointed to by the TEDBEngine ConfigPath property for local sessions, or the list of databases defined on the ElevateDB Server for remote sessions. List is a string list object, created and maintained by the application, into which to store the database names.

TEDBSession.GetRemoteDateTime Method

```
function GetRemoteDateTime: TDateTime
```

Call the GetRemoteDateTime method to retrieve the local date and time from an ElevateDB Server.

TEDBSession.GetRemoteServerDescription Method

```
function GetRemoteServerDescription: String
```

Use the GetRemoteServerDescription method to retrieve the description of an ElevateDB Server.

TEDBSession.GetRemoteServerName Method

```
function GetRemoteServerName: String
```

Use the GetRemoteServerName method to retrieve the name of an ElevateDB Server.

TEDBSession.GetRemoteServerVersion Method

```
function GetRemoteServerVersion: String
```

Call the GetRemoteServerVersion method to retrieve the ElevateDB version from an ElevateDB Server.

TEDBSession.GetRemoteUTCDateTime Method

```
function GetRemoteUTCDateTime: TDateTime
```

Call the GetRemoteUTCDateTime method to retrieve the universal coordinate date and time from an ElevateDB Server. This is especially useful if you are accessing a server in a different time zone and wish to get the date and time in a standard format that doesn't need to take into account the local server time offset.

TEDBSession.GetStoredProcNames Method

```
procedure GetStoredProcNames(const DatabaseName: String; List:
      TStrings)
```

Call the GetStoredProcNames method to populate a string list with the names of all stored procedures and functions found in the TEDBDatabase component specified by the DatabaseName parameter. List is a string list object, created and maintained by the application, into which to store the stored procedure and function names.

Note
The DatabaseName parameter can refer to either the DatabaseName property of a TEDBDatabase component or the name of an actual database. If the DatabaseName parameter matches the DatabaseName property of an existing TEDBDatabase component, then the stored procedure names returned will be from that TEDBDatabase component. Otherwise, the DatabaseName parameter will be treated as an actual database name and the stored procedure names will be retrieved from the appropriate database.

TEDBSession.GetTableNames Method

```
procedure GetTableNames(const DatabaseName: String; List:
      TStrings)
```

Call the GetTableNames method to populate a string list with the names of all tables found in the TEDBDatabase component specified by the DatabaseName parameter. List is a string list object, created and maintained by the application, into which to store the table names.

Note
The DatabaseName parameter can refer to either the DatabaseName property of a TEDBDatabase component or the name of an actual database. If the DatabaseName parameter matches the DatabaseName property of an existing TEDBDatabase component, then the table names returned will be from that TEDBDatabase component. Otherwise, the DatabaseName parameter will be treated as an actual database name and the table names will be retrieved from the appropriate database.

TEDBSession.Open Method

```
procedure Open
```

Call the Open method to connect a session. The Open method connects the session, triggering the BeforeConnect event before connecting and the AfterConnect event after successfully connecting. If the SessionType property is set to stRemote, then ElevateDB will attempt to connect to the ElevateDB Server specified by the RemoteHost or RemoteAddressand RemotePort or RemoteService properties. If the session can successfully connect to the ElevateDB Server, it will then automatically login to the server using the LoginUser and LoginPasword properties.

TEDBSession.OpenDatabase Method

```
function OpenDatabase(const DatabaseName: String): TEDBDatabase
```

Call the OpenDatabase method to open an existing TEDBDatabase component, or create a temporary TEDBDatabase component and open it. OpenDatabase calls the FindDatabase method to determine if the DatabaseName parameter corresponds to the DatabaseName property of an existing TEDBDatabase component. If it does not, OpenDatabase creates a temporary TEDBDatabase component, assigning the DatabaseName parameter to the DatabaseName property. It also assigns the DatabaseName parameter to the Database property. Finally, OpenDatabase calls the Open method of the TEDBDatabase component.

TEDBSession.SaveStoreFileToStream Method

```
procedure SaveStoreFileToStream(const StoreName: String; const
      FileName: String; DestStream: TStream)
```

Use the SaveStoreFileToStream method to load a store file into a stream. For more information, please see the Stores topic in the ElevateDB SQL Manual.

TEDBSession.SaveStreamToStoreFile Method

```
procedure SaveStreamToStoreFile(const StoreName: String; const
      FileName: String; SourceStream: TStream)
```

Use the SaveStreamToStoreFile method to save a stream as a store file. For more information, please see the Stores topic in the ElevateDB SQL Manual.

TEDBSession.AfterConnect Event

```
property AfterConnect: TNotifyEvent
```

The AfterConnect event is fired right after the session has been successfully connected. Write an event handler for this event to take action at this time.

TEDBSession.AfterDisconnect Event

```
property AfterDisconnect: TNotifyEvent
```

The AfterDisconnect event is fired right after the session has been successfully disconnected. Write an event handler for this event to take action at this time.

TEDBSession.BeforeConnect Event

```
property BeforeConnect: TNotifyEvent
```

The BeforeConnect event is fired right before the session is connected. Write an event handler for this event to take action at this time.

TEDBSession.BeforeDisconnect Event

```
property BeforeDisconnect: TNotifyEvent
```

The BeforeDisconnect event is fired right before the session is disconnected. Write an event handler for this event to take action at this time.

TEDBSession.OnLogin Event

```
property OnLogin: TEDBSessionLoginEvent
```

The OnLogin event is fired when the session is connected and the LoginUser and LoginPassword properties have not been assigned or have been assigned but are not valid. You can specify the user name and password via the UserName and Password parameters. The Continue parameter indicates whether the connection process should continue or whether the session should stop trying to connect.

Note
Any version of ElevateDB for Delphi 6 or higher (including C++Builder 6 and higher as well as Kylix 2 and higher) requires that you include the DBLogDlg unit to your uses clause in order to enable the display of a default remote login dialog. This is done to allow for ElevateDB to be included in applications without linking in the forms support, which can add a lot of unnecessary overhead and also cause unwanted references to user interface libraries. This is not required for Delphi 5 or C++Builder 5, but these versions always include forms support.

TEDBSession.OnLogMessage Event

```
property OnLogMessage: TEDBLogMessageEvent
```

The OnLogMessage event is fired when an SQL statement is executed via the Execute method and that statement generates log messages. Assign an event handler to the OnLogMessage event to save or display these log messages within your application. The following SQL statements will generate log messages:

ALTER TABLE
VERIFY TABLE
REPAIR TABLE
OPTIMIZE TABLE

TEDBSession.OnProgress Event

```
property OnProgress: TEDBProgressEvent
```

The OnProgress event is fired when an SQL statement is executed via the Execute method and that statement generates progress. Assign an event handler to the OnProgress event to display the progress in your application and to, optionally, abort the execution of the SQL statement by setting the Continue parameter to False. The following SQL statements will generate progress:

SELECT
INSERT
UPDATE
DELETE
ALTER TABLE
VERIFY TABLE
REPAIR TABLE
OPTIMIZE TABLE
IMPORT TABLE
EXPORT TABLE
MIGRATE DATABASE
BACKUP DATABASE
RESTORE DATABASE
SAVE UPDATES
LOAD UPDATES
COPY FILE
RENAME FILE
DELETE FILE

TEDBSession.OnRemoteReceiveProgress Event

```
property OnRemoteReceiveProgress: TEDBRemoteProgressEvent
```

The OnRemoteReceiveProgress event is fired whenever a remote session receives a response from the ElevateDB Server. The NumBytes parameter indicates the amount of data in bytes that has been received so far, and always starts at 0 bytes to indicate the beginning of a response. The PercentDone parameter indicates the percentage of the response that has been received so far, and is also 0 at the beginning of a response.

TEDBSession.OnRemoteReconnect Event

```
property OnRemoteReconnect: TEDBRemoteReconnectEvent
```

The OnRemoteReconnect event is fired when a remote session tries to send a request to the ElevateDB Server and cannot because the connection to the server has been broken. This is usually due to network issues or the remote session being disconnected by the server because the connection timeout setting for the server has been exceeded. In such a case the remote session would normally attempt an automatic reconnection. However, attaching an event handler to this event intercepts this reconnection process and allows the application to choose to skip the automatic reconnection by setting the Continue parameter to False (the default value is True). This can be useful in situations where the application knows that the network is down or there is a configuration issue that would prevent the remote session from reconnecting successfully. The application can also set the StopAsking parameter to True to tell ElevateDB that it should stop firing this event from now until the session's connection is finally terminated. This avoids a lot of calls to the event handler as tables and databases are closed and each of them try to send requests to the server.

TEDBSession.OnRemoteSendProgress Event

```
property OnRemoteSendProgress: TEDBRemoteProgressEvent
```

The OnRemoteSendProgress event is fired whenever a remote session sends a request to the ElevateDB Server. The NumBytes parameter indicates the amount of data in bytes that has been sent so far, and always starts at 0 bytes to indicate the beginning of a request. The PercentDone parameter indicates the percentage of the request that has been sent so far, and is also 0 at the beginning of a request.

TEDBSession.OnRemoteTimeout Event

```
property OnRemoteTimeout: TEDBRemoteTimeoutEvent
```

The OnRemoteTimeout event is fired when a remote session is waiting on a response from the ElevateDB Server and has not received a response within the number of seconds indicated by the RemoteTimeout property. The StayConnected parameter indicates whether the remote session should stay connected and keep waiting on a response or whether it should disconnect from the server.

TEDBSession.OnRemoteTrace Event

```
property OnRemoteTrace: TEDBRemoteTraceEvent
```

The OnRemoteTrace event is fired when remote message tracing is enabled for a remote session via the RemoteTrace property and a request is being sent to the ElevateDB Server or a response is being received from the server. You can use the Trace parameter to log information about the request or response.

TEDBSession.OnStatusMessage Event

```
property OnStatusMessage: TEDBStatusMessageEvent
```

The OnStatusMessage event is fired when an SQL statement is executed via the Execute method and that statement generates status messages. Assign an event handler to the OnStatusMessage event to display these messages in your application. All SQL statements will generate status messages.

6.11 TEDBStoredProc Component

Unit: edbcomps

Inherits From TEDBDBDataSet

Use the TEDBStoredProc component to prepare and execute a stored procedure or function. The parameter values for the stored procedure or function are automatically discovered when preparing the stored procedure or function, and then can be assigned values to be used when the stored procedure or function is executed. In addition, the component can execute stored procedures that return result sets and the returned result sets can be navigated and updated just like any other dataset. When executing functions, any result value can be read by examining the "Result" parameter that will automatically defined when preparing the function. This parameter will also have a TParam.ParamType value of ptResult.

Properties	Methods	Events
EngineVersion	CopyParams	AfterPrepare
ExecutionTime	ExecProc	AfterUnPrepare
ParamCount	ParamByName	BeforePrepare
Params	Prepare	BeforeUnPrepare
Prepared	UnPrepare	OnLogMessage
ProcedureHandle		OnProgress
StoredProcName		OnStatusMessage

TEDBStoredProc.EngineVersion Property

```
property EngineVersion: String
```

Indicates the current version of ElevateDB being used. This property is read-only.

TEDBStoredProc.ExecutionTime Property

```
property ExecutionTime: Double
```

The ExecutionTime property indicates the total time, in seconds, that the current procedure/function took to execute. This time does not include any time taken to compile the procedure/function, only the execution time itself.

TEDBStoredProc.ParamCount Property

```
property ParamCount: Integer
```

Use the ParamCount property to determine how many parameters are in the Params property. If the Prepared property is True, the ParamCount property always corresponds to the number of actual parameters in the procedure/function specified in the StoredProcName property.

TEDBStoredProc.Params Property

```
property Params: TParams
```

Use the Params property to specify the parameters for a procedure/function. The Params proerty is a zero-based array of TParam objects. Index specifies the array element to access.

Note
An easier way to set and retrieve parameter values when the name of each parameter is known is to call the ParamByName method.

TEDBStoredProc.Prepared Property

```
property Prepared: Boolean
```

Use the Prepared property to determine if a procedure/function is already prepared for execution. If Prepared is True, the procedure/function is prepared, and if Prepared is False, the procedure/function is not prepared. While a procedure/function need not be prepared before execution if it doesn't accept any parameters, it is recommended that you always prepare a procedure/function before executing it, particularly if the procedure/function accepts parameters and is executed more than once.

Note
An application can change the current setting of Prepared to prepare or unprepare a procedure/function. If Prepared is True, setting it to False calls the UnPrepare method to unprepare the procedure/function. If Prepared is False, setting it to True calls the Prepare method to prepare the procedure/function.

TEDBStoredProc.ProcedureHandle Property

```
property ProcedureHandle: TEDBProcedureManager
```

The ProcedureHandle property is for internal use only and is not useful to the application developer using ElevateDB.

TEDBStoredProc.StoredProcName Property

```
property StoredProcName: String
```

Use the StoredProcName property to specify the name of the procedure/function that the TEDBStoredProc component executes when its Open or ExecProc methods are called.

TEDBStoredProc.CopyParams Method

```
procedure CopyParams(Value: TParams)
```

Call CopyParams to copy the procedure/function's parameters into a separate parameter list object. Value is the parameter list into which to assign the procedure/function's parameters. Value can be the parameter list of another procedure/function. If the procedure/function is not prepared when an application calls CopyParams, CopyParams calls Prepare before assigning the parameters to the target parameters list, and then calls UnPrepare to return the procedure/function to its previous state.

TEDBStoredProc.ExecProc Method

```
procedure ExecProc
```

Call the ExecProc method to execute the procedure/function currently assigned to the StoredProcName property. If the procedure returns a result set, then the ExecProc method will automatically call the Open method to open the procedure's result set.

The ExecProc method prepares the procedure/function in the StoredProcName property for execution if it has not already been prepared. To speed performance in situations where a procedure/function will be executed multiple times with parameters, an application should ordinarily call the Prepare method before calling the ExecProc method for the first time.

TEDBStoredProc.ParamByName Method

```
function ParamByName(const Value: String): TParam
```

Call the ParamByName method to set or access parameter information for a specific parameter based on its name. Value is the name of the parameter to access.

TEDBStoredProc.Prepare Method

```
procedure Prepare
```

Call the Prepare method to have ElevateDB allocate resources for the execution of a procedure/function, compile the procedure/function, and perform the process of setting up the procedure/function for execution. The procedure/function is specified via the StoredProcName property.

ElevateDB automatically prepares a procedure/function if it is executed without first being prepared. After execution, ElevateDB unprepares the procedure/function. When a procedure/function will be executed a number of times, an application should always explicitly prepare the procedure/function using the Prepare method to avoid multiple and unnecessary prepares and unprepares.

Preparing a procedure/function consumes some database resources, so it is good practice for an application to unprepare a procedure/function once it is done using it. The UnPrepare method unprepares a procedure/function.

Note
When you change the StoredProcName property, the current procedure/function is automatically closed and unprepared.

TEDBStoredProc.UnPrepare Method

```
procedure UnPrepare
```

Call the UnPrepare method to free the resources allocated for a procedure/function previously prepared with the Prepare method.

TEDBStoredProc.AfterPrepare Event

```
property AfterPrepare: TNotifyEvent
```

The AfterPrepare event is fired right after the procedure/function has been successfully prepared by calling the Prepare method or by setting the Prepared to True. Write an event handler for this event to take action at this time.

TEDBStoredProc.AfterUnPrepare Event

```
property AfterUnPrepare: TNotifyEvent
```

The AfterUnPrepare event is fired right after the procedure/function has been unprepared by calling the UnPrepare method or by setting the Prepared to False. Write an event handler for this event to take action at this time.

TEDBStoredProc.BeforePrepare Event

```
property BeforePrepare: TNotifyEvent
```

The BeforePrepare event is fired right before the procedure/function is prepared by calling the Prepare method or by setting the Prepared to True. Write an event handler for this event to take action at this time.

TEDBStoredProc.BeforeUnPrepare Event

```
property BeforeUnPrepare: TNotifyEvent
```

The BeforePrepare event is fired right before the procedure/function is unprepared by calling the UnPrepare method or by setting the Prepared to False. Write an event handler for this event to take action at this time.

TEDBStoredProc.OnLogMessage Event

```
property OnLogMessage: TEDBLogMessageEvent
```

The OnLogMessage event is fired when a procedure/function is executed via the ExecProc or Open methods and that procedure generates log messages. Assign an event handler to the OnLogMessage event to save or display these log messages within your application.

TEDBStoredProc.OnProgress Event

```
property OnProgress: TEDBProgressEvent
```

The OnProgress event is fired when a procedure/function is executed via the ExecProc or Open methods and that procedure generates progress. Assign an event handler to the OnProgress event to display the progress in your application and to, optionally, abort the execution of the procedure by setting the Continue parameter to False.

Note
Whether a procedure/function aborts its execution when setting the Continue parameter to False depends completely upon the procedure/function code. The procedure/function can choose to completely ignore the request to abort execution.

TEDBStoredProc.OnStatusMessage Event

```
property OnStatusMessage: TEDBStatusMessageEvent
```

The OnStatusMessage event is fired when a procedure/function is executed via the ExecProc or Open methods and that procedure generates status messages. Assign an event handler to the OnStatusMessage event to display these messages in your application. All procedures/functions will generate status messages.

6.12 TEDBTable Component

Unit: edbcomps

Inherits From TEDBDBDataSet

Use the TEDBTable component to access rows and columns in a table or view. A TEDBTable component can also work with a subset of rows within a table or view by using ranges and filters.

Properties	Methods	Events
EngineVersion	ApplyRange	OnLogMessage
Exclusive	CancelRange	OnProgress
IndexDefs	EditKey	OnStatusMessage
IndexFieldCount	EditRangeEnd	
IndexFieldNames	EditRangeStart	
IndexFields	FindKey	
IndexName	FindNearest	
KeyFieldCount	GetIndexNames	
MasterFields	GotoCurrent	
MasterSource	GotoKey	
PhysicalRecordCount	GotoNearest	
Ranged	SetKey	
StoreDefs	SetRange	
TableName	SetRangeEnd	
	SetRangeStart	

TEDBTable.EngineVersion Property

```
property EngineVersion: String
```

Indicates the current version of ElevateDB being used. This property is read-only.

TEDBTable.Exclusive Property

```
property Exclusive: Boolean
```

Use the Exclusive property to True to specify that the table or view should be opened exclusively when calling the Open method or when setting the Active property to True. When the Exclusive property is set to True and the application successfully opens the table or view, no other application can access the table or view. If the table or view for which the application has requested exclusive access is already in use by another application, an exception is raised.

A table or view must be closed (Active property should be False) before changing the setting of the Exclusive property. Do not set Exclusive to True at design time if you also intend to set the Active property to True at design time. In this case an exception is raised because the table or view is already in use by the IDE.

TEDBTable.IndexDefs Property

```
property IndexDefs: TIndexDefs
```

The IndexDefs property lists the index definitions for a table. While an application can examine IndexDefs to explore the index definitions for a table. To set the active index for a table, use the IndexName or IndexFieldNames property.

Note
The index definitions in the IndexDefs may not always reflect the current index definitions available for a table unless the table has been opened and the IndexName or IndexFieldNames property has been assigned a value. Before using the index definitions from an existing table, call the Update method to read the index definitions from the actual table.

TEDBTable.IndexFieldCount Property

```
property IndexFieldCount: Integer
```

The IndexFieldCount property indicates the number of columns that make up the active index in the table. The IndexName or IndexFieldNames property can be used to set and inspect the active index for the table.

TEDBTable.IndexFieldNames Property

```
property IndexFieldNames: String
```

Use the IndexFieldNames property as an alternative method to the IndexName property of specifying the active index for a table. Each column name should be separated with a semicolon. Any column names specified in the IndexFieldNames property must already be indexed, and must exist in the index in the order specified, from left to right.

Note
The IndexFieldNames and IndexName properties are mutually exclusive. Setting one clears the other.

TEDBTable.IndexFields Property

```
property IndexFields[Index: Integer]: TField
```

Use the IndexFields property to access a TField object for a given column in an index. The IndexFields property provides a zero-based array of TField objects. The first column in the index is referenced as IndexFields[0], the second is referenced as IndexFields[1], and so on.

Note
Do not set the IndexFields propety directly. Instead use the IndexName or IndexFieldNames property to set the active index for a table.

TEDBTable.IndexName Property

```
property IndexName: String
```

Use the IndexName property to specify the active index for a table. If the IndexName property is empty (the default), the active index is set to the default order for the table. The default order is the primary key of the table or, if a primary key is not defined for the table, the natural row insertion order for the table. If the IndexName property is set to a valid index name, then that index is used to determine the sort order of rows, otherwise an exception will be raised.

Note
The IndexName and IndexFieldNames properties are mutually exclusive. Setting one clears the other.

TEDBTable.KeyFieldCount Property

```
property KeyFieldCount: Integer
```

Use the KeyFieldCount property to limit a search on the active multi-column index to a consecutive sub-set (left to right) of the index columns. For example, if the active index for a table consists of three columns, a partial-key search can be conducted using only the first column in the index by setting KeyFieldCount to 1. If the KeyFieldCount property is 0, the table searches on all columns in the index. The active index for a table is specified via the IndexName or IndexFieldNames property.

Note
Searches are only conducted based on consecutive indexed columns beginning with the first column in the index. For example if an index consists of three columns, an application can set the KeyFieldCount property to 1 to search on the first column, 2 to search on the first and second columns, or 3 to search on all columns. By default KeyFieldCount is initially set to include all columns in a search.

TEDBTable.MasterFields Property

```
property MasterFields: String
```

After setting the MasterFields property, use the MasterFields property to specify the names of one or more columns to use in establishing a master-detail link between this table and the data source specified in the MasterSource property. Separate multiple column names with a semicolon. Each time the current row in the master data source changes, the new values in the master columns are used to select corresponding rows in this table for display.

Note
At design time, you can use the Field Link property editor to establish a master-detail link between a data source and the current table.

TEDBTable.MasterSource Property

```
property MasterSource: TDataSource
```

Use the MasterSource property to specify the name of a TDataSource component whose DataSet property identifies a dataset to use as a master table in establishing a master-detail link with this table. After setting the MasterSource property, specify which columns to use in the master data source by setting the MasterFields property.

TEDBTable.PhysicalRecordCount Property

```
property PhysicalRecordCount: Integer
```

The PhysicalRecordCount property indicates the number of rows present in the table or view, irrespective of any filters or ranges that may currently be active.

TEDBTable.Ranged Property

```
property Ranged: Boolean
```

The Ranged property indicates whether a range if active for the current table.

TEDBTable.StoreDefs Property

```
property StoreDefs: Boolean
```

The StoreDefs property indicates whether the FieldDefs property and its contained list of TFieldDef objects, as well as the IndexDefs property and its contained list of TIndexDef objects, will be stored at design-time.

TEDBTable.TableName Property

```
property TableName: String
```

Use the TableName property to specify the name of the table or view that this TEDBTable component should access. The TableName property is used in conjunction with the DatabaseName property to specify the database name and table or view name.

Note
To set the TableName property, the Active property must be False.

TEDBTable.ApplyRange Method

```
procedure ApplyRange
```

Call the ApplyRange method to cause a range established with the SetRangeStart and SetRangeEnd or EditRangeStart and EditRangeEnd methods to take effect. When a range is in effect, only those rows that fall within the range are available for viewing and editing.

TEDBTable.CancelRange Method

```
procedure CancelRange
```

Call the CancelRange method to remove a range currently applied to a table using the SetRange or ApplyRange methods. Cancelling a range reenables access to all rows in the table.

TEDBTable.EditKey Method

```
procedure EditKey
```

Call the EditKey method to put the table in dsSetKey state while preserving the current contents of the current search key buffer. To set the current search values, you can use the IndexFields property to iterate over the columns used by the active index. The IndexName or IndexFieldNames property specifies the active index. Once the search values are set, you can then use the GotoKey or GotoNearest method to perform the actual search.

EditKey is especially useful when performing multiple searches where only one or two column values among many change between each search.

TEDBTable.EditRangeEnd Method

```
procedure EditRangeEnd
```

Call the EditRangeEnd method to change the ending value for an existing range. To specify an end range value, call the FieldByName method after calling the EditRangeEnd method. After assigning a new ending value, call the ApplyRange method to activate the modified range.

TEDBTable.EditRangeStart Method

```
procedure EditRangeStart
```

Call the EditRangeStart method to change the starting value for an existing range. To specify a starting range value, call the FieldByName method after calling the EditRangeStart method. After assigning a new starting value, call the ApplyRange method to activate the modified range.

TEDBTable.FindKey Method

```
function FindKey(const KeyValues: array of const): Boolean
```

Call the FindKey method to search for a specific row in a table using the active index. The IndexName or IndexFieldNames property specifies the active index. The KeyValues parameter contains a comma-delimited array of column values. Each value in the KeyValues parameter can be a literal, a variable, a null, or nil. If the number of values passed in the KeyValues parameters is less than the number of columns in the active index, the missing values are assumed to be null. If a search is successful, the FindKey method positions the table on the matching row and returns True. Otherwise the current table position is not altered, and FindKey returns False.

TEDBTable.FindNearest Method

```
function FindNearest(const KeyValues: array of const): Boolean
```

Call the FindNearest method search for a row in the table that is greater than or equal to the values specified in the KeyValues parameter using the active index. The IndexName or IndexFieldNames property specifies the active index. The KeyValues parameter contains a comma-delimited array of column values. If the number of values passed in the KeyValues parameter is less than the number of columns in the active index, the missing values are assumed to be null. FindNearest positions the table either on a row that exactly matches the search criteria, returning True, or on the first row whose values are greater than those specified in the search criteria, returning False.

TEDBTable.GetIndexNames Method

```
procedure GetIndexNames(List: TStrings)
```

Call the GetIndexNames method to retrieve a list of all available indexes for a table. The List parameter is a string list object, created and maintained by the application, into which to retrieve the index names.

TEDBTable.GotoCurrent Method

```
procedure GotoCurrent(Table: TEDBTable)
```

Call the GotoCurrent method to synchronize the current position for the table or view based on the current position in another TEDBTable component, but which is connected to the same underlying table or view. The Table parameter is the TEDBTable component whose position should be used for synchronizing.

Note
This procedure works only for TEDBTable components that have the same DatabaseName and TableName properties. Otherwise an exception is raised.

TEDBTable.GotoKey Method

```
function GotoKey: Boolean
```

Use the GotoKey method to move to a row specified by search values assigned with previous calls to the SetKey or EditKey methods. The search is peformed using the active index. The IndexName or IndexFieldNames property specifies the active index. If the GotoKey method finds a matching row, it positions the table on the row and returns True. Otherwise the current table position remains unchanged, and GotoKey returns False.

TEDBTable.GotoNearest Method

```
function GotoNearest: Boolean
```

Call the GotoNearest method to position the table on the row that is either the exact row specified by the current search values, returning True, or on the first row whose values exceed those specified, returning False. The search is peformed using the active index. The IndexName or IndexFieldNames property specifies the active index. Before calling the GotoNearest method, an application must specify the search values by calling the SetKey or EditKey methods, which put the table into the dsSetKey state. The application then uses the FieldByName method to populate the search values.

TEDBTable.SetKey Method

```
procedure SetKey
```

Call the SetKey method to put the table into dsSetKey state and clear the current search values. The FieldByName method can then be used to supply a new set of search values prior to conducting a search using the active index. The IndexName or IndexFieldNames property specifies the active index.

Note
To modify existing search values, call the EditKey method instead.

TEDBTable.SetRange Method

```
procedure SetRange(const StartValues,EndValues: array of const)
```

Call the SetRange method to specify a range and apply it to the table. A range is set using the active index. The IndexName or IndexFieldNames property specifies the active index. The StartValues parameter indicates the column values that designate the first row in the range. The EndValues parameter indicates the column values that designate the last row in the range. If either the StartValues or EndValues parameters has fewer elements than the number of columns in the active index, then the remaining entries are set to NULL.

The SetRange method combines the functionality of the SetRangeStart, SetRangeEnd, and ApplyRange methods in a single method call.

TEDBTable.SetRangeEnd Method

```
procedure SetRangeEnd
```

Call the SetRangeEnd method to put the table into dsSetKey state, erase any previous end range values, and set them to NULL. The FieldByName method can be used to set the ending values for a range.

After assigning ending range values to FieldValues, call the ApplyRange method to activate the modified range.

TEDBTable.SetRangeStart Method

```
procedure SetRangeStart
```

Call the SetRangeStart method to put the table into dsSetKey state, erase any previous start range values, and set them to NULL. The FieldByName method can be used to set the starting values for a range.

After assigning starting range values to FieldValues, call the ApplyRange method to activate the modified range.

TEDBTable.OnLogMessage Event

```
property OnLogMessage: TEDBLogMessageEvent
```

The OnLogMessage event is fired when a trigger is executed on the table and that trigger generates log messages. Assign an event handler to the OnLogMessage event to save or display these log messages within your application.

TEDBTable.OnProgress Event

```
property OnProgress: TEDBProgressEvent
```

The OnProgress event is fired when a trigger is executed on the table and that trigger generates progress. Assign an event handler to the OnProgress event to display the progress in your application and to, optionally, abort the execution of the trigger by setting the Continue parameter to False.

Note
Whether a trigger aborts its execution when setting the Continue parameter to False depends completely upon the trigger code. The trigger can choose to completely ignore the request to abort execution.

TEDBTable.OnStatusMessage Event

```
property OnStatusMessage: TEDBStatusMessageEvent
```

The OnStatusMessage event is fired when a trigger is executed on the table and that trigger generates status messages. Assign an event handler to the OnStatusMessage event to save or display these status messages within your application.

6.13 TEDBUpdateSQL Component

Unit: edbcomps

Inherits From TEDBSQLUpdateObject

Use the TEDBUpdateSQL component to update table(s) during the application of updates from a TClientDataSet component through the IProvider support in ElevateDB. Usually the TEDBUpdateSQL component is used to handle complex updates to multiple tables that cannot be handled by the default IProvider support.

Properties	Methods	Events
DatabaseName	Apply	
DeleteSQL	Create	
InsertSQL	ExecSQL	
ModifySQL	SetParams	
Query		
SessionName		
SQL		

TEDBUpdateSQL.DatabaseName Property

```
property DatabaseName: String
```

This property is automatically internally set by ElevateDB.

TEDBUpdateSQL.DeleteSQL Property

```
property DeleteSQL: TStrings
```

Use the DeleteSQL property to specify the DELETE statement to use when applying a deletion to a source table. Use parameters with the same names as any column names in the source table for any WHERE clause conditions, and use the prefix "OLD_" on any parameter names where you want an original column value to be used instead of the current column value being used for the update.

TEDBUpdateSQL.InsertSQL Property

```
property InsertSQL: TStrings
```

Use the InsertSQL property to specify the INSERT statement to use when applying an insert to a source table. Use parameters with the same names as any column names in the source table.

TEDBUpdateSQL.ModifySQL Property

```
property ModifySQL: TStrings
```

Use the ModifySQL property to specify the UPDATE statement to use when applying an update to a source table. Use parameters with the same names as any column names in the source table for any SET operations or WHERE clause conditions, and use the prefix "OLD_" on any parameter names where you want an original column value to be used instead of the current column value being used for the update.

TEDBUpdateSQL.Query Property

```
property Query[UpdateKind: TUpdateKind]: TEDBQuery
```

The Query property provides a reference to the internal TEDBQuery component actually used to execute the SQL in the InsertSQL, ModifySQL, and DeleteSQL properties.

TEDBUpdateSQL.SessionName Property

```
property SessionName: String
```

This property is automatically internally set by ElevateDB.

TEDBUpdateSQL.SQL Property

```
property SQL[UpdateKind: TUpdateKind]: TStrings
```

The SQL property indicates the SQL statement in the InsertSQL, ModifySQL, or DeleteSQL property, depending on the setting of the UpdateKind index.

TEDBUpdateSQL.Apply Method

```
procedure Apply(UpdateKind: TUpdateKind)
```

Call the Apply method to set the parameters for an SQL statement and execute it in order to update a row. The UpdateKind parameter indicates which SQL statement to bind and execute. The Apply method is primarily intended for manually executing update statements from an OnUpdateRecord event handler.

Note
If an SQL statement does not contain parameters, it is more efficient to call the ExecSQL method instead of the Apply method.

TEDBUpdateSQL.Create Method

```
constructor Create(AOwner: TComponent)
```

Call the Create constructor to create an instance of the TEDBUpdateSQL component.

TEDBUpdateSQL.ExecSQL Method

```
procedure ExecSQL(UpdateKind: TUpdateKind)
```

Call the ExecSQL method to execute an SQL statement in order to update a row. The UpdateKind parameter indicates which SQL statement to execute.

Note
If the statement to execute contains any parameters, an application must call the SetParams method to bind the parameters before calling the ExecSQL method.

TEDBUpdateSQL.SetParams Method

```
procedure SetParams(UpdateKind: TUpdateKind)
```

Call the SetParams method to bind any parameters in an SQL statement associated with the update object prior to executing the statement. Parameters are indicated in an SQL statement by a colon. Except for the leading colon in the parameter name, the parameter name must exactly match the name of an existing column name for the source table.

Note
Parameter names can be prefaced by the "OLD_" prefix. If so, the old value of the column is used to perform the update instead of any updates in the cache.

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Chapter 7
Type Reference

7.1 pEDBLongWord Type

Unit: edbtype

```
pEDBLongWord = ^TEDBLongWord
```

7.2 pInteger Type

Unit: edbtype

```
pInteger = ^Integer
```

7.3 pPointer Type

Unit: edbtype

```
pPointer = ^Pointer
```

7.4 TEDBApplyCachedUpdatesOption Type

Unit: edbcomps

```
TEDBApplyCachedUpdatesOption = (acMergeDuplicateInserts,
      acIgnoreMissingUpdates, acInsertMissingUpdates)
```

Element	Description
acIgnoreMissingUpdates	
acInsertMissingUpdates	
acMergeDuplicateInserts	

7.5 TEDBApplyCachedUpdatesOptions Type

Unit: edbcomps

```
TEDBApplyCachedUpdatesOptions = set of
      TEDBApplyCachedUpdatesOption
```

7.6 TEDBBytes Type

Unit: edbtype

```
TEDBBytes = array of Byte
```

This type is a synonym for the array of Byte type.

7.7 TEDBCharacterSet Type

Unit: edbcomps

```
TEDBCharacterSet = (csAnsi,csUnicode)
```

This type is used with the TEDBEngine CharacterSet and TEDBSession CharacterSet properties to specify the character set that should be used for all database access.

Element	Description
csAnsi	Indicates that the ANSI character set is being used (256 characters with code pages).
csUnicode	Indicates that the Unicode character set is being used (65536 characters).

7.8 TEDBDate Type

Unit: edbtype

```
TEDBDate = Integer
```

This type is a synonym for the Integer type.

7.9 TEDBDayTimeInterval Type

Unit: edbtype

```
TEDBDayTimeInterval = Int64
```

This type is a synonym for the Int64 type.

7.10 TEDBDayTimeIntervalType Type

Unit: edbcomps

```
TEDBDayTimeIntervalType = (dtUnknown,dtDay,dtHour,dtMinute,
      dtSecond,dtMSecond, dtDayHour,dtDayMinute,dtDaySecond,
      dtDayMSecond, dtHourMinute,dtHourSecond,dtHourMSecond,
      dtMinuteSecond,dtMinuteMSecond, dtSecondMSecond)
```

This type indicates the type of day-time interval to use with the TEDBEngine DayTimeIntervalToSQLStr and SQLStrToDayTimeInterval methods. Please see the Interval Types topic for more information.

Element	Description
dtDay	Indicates that the value is a day interval.
dtDayHour	Indicates that the value is a day-hour interval.
dtDayMinute	Indicates that the value is a day-minute interval.
dtDayMSecond	Indicates that the value is a day-millisecond interval.
dtDaySecond	Indicates that the value is a day-second interval.
dtHour	Indicates that the value is an hour interval.
dtHourMinute	Indicates that the value is an hour-minute interval.
dtHourMSecond	Indicates that the value is an hour-millisecond interval.
dtHourSecond	Indicates that the value is an hour-second interval.
dtMinute	Indicates that the value is a minute interval.
dtMinuteMSecond	Indicates that the value is a minute-millisecond interval.
dtMinuteSecond	Indicates that the value is a minute-second interval.
dtMSecond	Indicates that the value is a millisecond interval.
dtSecond	Indicates that the value is a second interval.
dtSecondMSecond	Indicates that the value is a second-millisecond interval.
dtUnknown	Indicates that the value's interval type is unknown.

7.11 TEDBDebugNotificationEvent Type

Unit: edbcomps

```
TEDBDebugNotificationEvent = procedure (Sender: TObject;
      SourceLine: Integer; ExceptionRaised: TObject) of object
```

This type is used for the TEDBScript OnDebugNotification event.

7.12 TEDBDebugVariable Type

Unit: edbcomps

```
TEDBDebugVariable = record Name: String; VariableType:
      TEDBDebugVariableType; Line: Integer; Column: Integer; DataType:
      String; Count: Integer; Value: String; end
```

This type is used with the TEDBScript GetDebugVariable method.

7.13 TEDBDebugVariableType Type

Unit: edbcomps

```
TEDBDebugVariableType = (vtNone,vtSimple,vtArray,vtRow,vtCursor,
      vtStatement)
```

This type is used with the TEDBScript TEDBDebugVariable record type to specify the type of variable being described.

Element	Description
vtArray	Indicates an array type.
vtCursor	Indicates a cursor type.
vtNone	Indicates an unknown type.
vtRow	Indicates a row type.
vtSimple	Indicates a simple scalar type.
vtStatement	Indicates a statement type.

7.14 TEDBEngineType Type

Unit: edbcomps

```
TEDBEngineType = (etClient,etServer)
```

This type is used to indicate the type of engine that the TEDBEngine component is being used as in the application. Please see the Configuring and Starting the Engine for more information.

Element	Description
etClient	Indicates that the engine is configured as a client engine.
etServer	Indicates that the engine is configured as an ElevateDB server.

7.15 TEDBFileEncoding Type

Unit: edbcomps

```
TEDBFileEncoding = (feAuto,feAnsi,feUnicode)
```

This type is used to indicate the encoding of the import/export files when calling the TEDBDataSet Import and Export methods.

Element	Description
feAnsi	Indicates an ANSI-encoded (byte-per-character, with code-page translations) import/export file.
feAuto	Indicates that the encoding of the import/export file defaults to match that of the character set of the current session.
feUnicode	Indicates a Unicode-encoded (two bytes-per-character, Unicode code points) import/export file.

7.16 TEDBFileFormat Type

Unit: edbcomps

```
TEDBFileFormat = (ffDelimited,ffXML)
```

This type is used to indicate the format of the import/export files when calling the TEDBDataSet Import and Export methods.

Element	Description
ffDelimited	Indicates a delimited import/export file.
ffXML	Indicates an XML import/export file.

7.17 TEDBLogCategories Type

Unit: edbcomps

```
TEDBLogCategories = set of TEDBLogCategory
```

This set type is used with the TEDBEngine LogCategories property to specify which types of log categories should be logged by the engine.

7.18 TEDBLogCategory Type

Unit: edbcomps

```
TEDBLogCategory = (lcInformation,lcWarning,lcError)
```

This type is used with the TEDBEngine LogCategories property to specify which types of log categories should be logged by the engine.

Element	Description
lcError	Indicates an error log category.
lcInformation	Indicates an informational log category.
lcWarning	Indicates a warning log category.

7.19 TEDBLogMessageEvent Type

Unit: edbcomps

```
TEDBLogMessageEvent = procedure (Sender: TObject; const
      LogMessage: String) of object
```

This type is used for the TEDBSession OnLogMessage, TEDBDatabase OnLogMessage, TEDBQuery OnLogMessage, and TEDBStoredProc OnLogMessage events.

7.20 TEDBLongWord Type

Unit: edbtype

```
TEDBLongWord = Cardinal
```

7.21 TEDBProgressEvent Type

Unit: edbcomps

```
TEDBProgressEvent = procedure (Sender: TObject; PercentDone:
      Integer; var Continue: Boolean) of object
```

This type is used for the TEDBSession OnProgress, TEDBDatabase OnProgress, TEDBQuery OnProgress, and TEDBStoredProc OnProgress events.

7.22 TEDBRecordLockProtocol Type

Unit: edbcomps

```
TEDBRecordLockProtocol = (lpPessimistic,lpOptimistic)
```

This type is used with the TEDBSession RecordLockProtocol property.

Element	Description
lpOptimistic	Indicates an optimistic row locking model.
lpPessimistic	Indicates a pessimistic row locking model.

7.23 TEDBRemoteProgressEvent Type

Unit: edbcomps

```
TEDBRemoteProgressEvent = procedure (Sender: TObject; NumBytes:
      Integer; PercentDone: Integer) of object
```

This type is used for the TEDBSession OnRemoteSendProgress and OnRemoteReceiveProgress events.

7.24 TEDBRemoteReconnectEvent Type

Unit: edbcomps

```
TEDBRemoteReconnectEvent = procedure (Sender: TObject; var
      Continue: Boolean; var StopAsking: Boolean) of object
```

This type is used for the TEDBSession OnRemoteReconnect event.

7.25 TEDBRemoteTimeoutEvent Type

Unit: edbcomps

```
TEDBRemoteTimeoutEvent = procedure (Sender: TObject; var
      StayConnected: Boolean) of object
```

This type is used for the TEDBSession OnRemoteTimeout event.

7.26 TEDBRemoteTrace Type

Unit: edbcomps

```
TEDBRemoteTrace = record DateTime: TDateTime; ElapsedTime:
      TEDBLongWord; Compression: Integer; FunctionCode: Integer;
      FunctionName: String; ResultCode: Integer; Size: Integer; Info:
      String; end
```

This type is used as a parameter to the TEDBSession OnRemoteTrace event. The fields of the record are as follows:

Field	Description
DateTime	Indicates the date and time of the request/response.
ElapsedTime	Indicates the total elapsed time in milliseconds for the request/response.
Compression	Indicates the current compression level for the request/response. This value normally ranges from 0 (no compression) to 9 (best compression), but in some cases may actually appear in the trace record as values greater than or equal to 10. In these cases, the compression has been adjusted by the engine due to the size of the data being too small (less than 1024 bytes). The adjusted compression level can be found by doing this calculation: Compression mod 10 And the original compression level before the adjustment can be found by using the following calculation: Compression div 10 Any adjustments to the compression such as this are active for the current request/response only and do not persist any further.
FunctionCode	Indicates the function ID of the request.
FunctionName	Indicates the function name of the request.
ResultCode	Indicates the result code of the request/response. If this value is -1, then the trace record represents a request. Any 0 or higher value indicates that the trace record is a response. You can use this field to determine whether the trace record is for a request (-1) or a response (0 or higher).
Size	Indicates the request/response size, in bytes.
Info	Indicates any additional information about the request, such as the SQL being prepared or executed, or the name of a table being opened.

7.27 TEDBRemoteTraceEvent Type

Unit: edbcomps

```
TEDBRemoteTraceEvent = procedure (Sender: TObject; Trace:
      TEDBRemoteTrace) of object
```

This type is used for the TEDBSession OnRemoteTrace event.

7.28 TEDBServerProcedureEvent Type

Unit: edbcomps

```
TEDBServerProcedureEvent = procedure (Sender: TObject;
      ServerProcedure: TEDBServerProcedure) of object
```

This type is used for the TEDBEngine OnServerProcedure event.

7.29 TEDBServerSession Type

Unit: edbcomps

```
TEDBServerSession = record ID: Integer; Name: String;
      Description: String; Created: TDateTime; LastConnected:
      TDateTime; Connected: Boolean; Encrypted: Boolean; Address:
      String; UserName: String; ProcessName: String; end
```

This type is used as a parameter to the TEDBEngine OnServerSessionEvent event. The fields of the record are as follows:

Field	Description
ID	Indicates the session ID.
Name	Indicates the session name.
Description	Indicates the session description.
Created	Indicates the date and time when the session was created.
LastConnected	Indicates the last date and time the session was connected.
Connected	Indicates whether the session is currently connected or not.
Encrypted	Indicates whether the session connection is encrypted.
Address	Indicates the IP address of the session connection.
UserName	Indicates the user name of the session.
ProcessName	Indicates the process name of the session.

7.30 TEDBServerSessionEvent Type

Unit: edbcomps

```
TEDBServerSessionEvent = procedure(Sender: TObject; EventType:
      TEDBServerSessionEventType; const Session: TEDBServerSession;
      var UserObject: TObject) of object
```

This type is used for the TEDBEngine OnServerSessionEvent event.

7.31 TEDBServerSessionEventType Type

Unit: edbcomps

```
TEDBServerSessionEventType = (seOpen,seConnect,seLogin,seLogout,
      seDisconnect,seClose)
```

This type is used as a parameter to the TEDBEngine OnServerSessionEvent event.

Element	Description
seClose	Indicates that the session is being closed.
seConnect	Indicates that the session is being connected.
seDisconnect	Indicates that the session is being disconnected.
seLogin	Indicates that the session is logging in.
seLogout	Indicates that the session is logging out.
seOpen	Indicates that the session is begin opened.

7.32 TEDBServerSessionLoginEvent Type

Unit: edbcomps

```
TEDBServerSessionLoginEvent = procedure(Sender: TObject; const
      UserName: String; const UserPassword: String; const Address:
      String; const ProcessName: String; ThreadID: Integer;
      ReleaseNumber: Currency; BuildNumber: Integer; var AllowLogin:
      Boolean) of object
```

This type is used for the TEDBEngine OnServerSessionLoginEvent event.

7.33 TEDBServerTrace Type

Unit: edbcomps

```
TEDBServerTrace = record SessionVersion: Currency; SessionBuild:
      Integer; SessionType: String; SessionAddress: String;
      SessionProcessName: String; SessionName: String;
      SessionDescription: String; SessionThreadID: Integer;
      SessionEncrypted: Boolean; DateTime: TDateTime; ElapsedTime:
      TEDBLongWord; Compression: Integer; FunctionCode: Integer;
      FunctionName: String; ResultCode: Integer; ResultElapsedTime:
      TEDBLongWord; Size: Integer; Info: String; end
```

This type is used as a parameter to the TEDBEngine OnServerTrace event. The fields of the record are as follows:

Field	Description
SessionVersion	Indicates the ElevateDB version being used by the remote session.
SessionBuild	Indicates the ElevateDB build number being used by the remote session.
SessionType	Indicates the ElevateDB product type being used by the remote session.
SessionAddress	Indicates the IP address of the remote session.
SessionProcessName	Indicates the process name of the remote session.
SessionName	Indicates the name (ID) of the remote session.
SessionDescription	Indicates the description of the remote session.
SessionThreadID	Indicates the thread ID of the remote session.
SessionEncrypted	Indicates whether the remote session is using an encrypted connection.
DateTime	Indicates the date and time of the request/response.
ElapsedTime	Indicates the total elapsed time in milliseconds for the request/response.
Compression	Indicates the current compression level for the request/response. This value normally ranges from 0 (no compression) to 9 (best compression), but in some cases may actually appear in the trace record as values greater than or equal to 10. In these cases, the compression has been adjusted by the engine due to the size of the data being too small (less than 1024 bytes). The adjusted compression level can be found by doing this calculation: Compression mod 10 And the original compression level before the adjustment can

	be found by using the following calculation: Compression div 10 Any adjustments to the compression such as this are active for the current request/response only and do not persist any further.
FunctionCode	Indicates the function ID of the request.
FunctionName	Indicates the function name of the request.
ResultCode	Indicates the result code of the request/response. If this value is -1, then the trace record represents a request. Any 0 or higher value indicates that the trace record is a response. You can use this field to determine whether the trace record is for a request (-1) or a response (0 or higher).
Size	Indicates the request/response size, in bytes.
Info	Indicates any additional information about the request, such as the SQL being prepared or executed, or the name of a table being opened.

7.34 TEDBServerTraceEvent Type

Unit: edbcomps

```
TEDBServerTraceEvent = procedure (Sender: TObject; const Trace:
      TEDBServerTrace) of object
```

This type is used for the TEDBEngine OnServerTrace event.

7.35 TEDBSessionLoginEvent Type

Unit: edbcomps

```
TEDBSessionLoginEvent = procedure (Sender: TObject; var
      UserName: String; var Password: String; var Continue: Boolean)
      of object
```

This type is used for the TEDBSession OnLogin event.

7.36 TEDBSessionType Type

Unit: edbcomps

```
TEDBSessionType = (stLocal,stRemote)
```

This type is used to indicate the type of session that the TEDBSession component is being used as in the application.

Element	Description
stLocal	Indicates the session is a local session directly accessing a local or network-based hard drive where the databases and tables are located.
stRemote	Indicates the session is a remote session connecting to an ElevateDB Server.

7.37 TEDBSetSequenceEvent Type

Unit: edbcomps

```
TEDBSetSequenceEvent = procedure (Sender: TObject; Value:
      Integer) of object
```

7.38 TEDBSQLStatementType Type

Unit: edbcomps

```
TEDBSQLStatementType = (stUnknown,stSelect,stInsert,stUpdate,
      stDelete, stCreateDatabase,stCreateUser,stCreateRole,stCreateJob,
       stCreateStore,stCreateModule,stCreateTextFilter,
      stCreateWordGenerator,stCreateMigrator, stCreateTable,
      stCreateView,stCreateIndex, stCreateTrigger,stCreateTextIndex,
      stCreateFunction, stCreateProcedure, stDropDatabase,stDropUser,
      stDropRole, stDropJob,stDropStore,stDropModule,stDropTextFilter,
      stDropWordGenerator,stDropMigrator, stDropTable,stDropView,
      stDropIndex, stDropTrigger,stDropFunction,stDropProcedure,
      stAlterDatabase,stAlterUser,stAlterRole,stAlterJob, stAlterStore,
      stAlterModule,stAlterTextFilter, stAlterWordGenerator,
      stAlterMigrator, stAlterTable,stAlterView,stAlterIndex,
      stAlterTrigger,stAlterFunction,stAlterProcedure,
      stRenameDatabase,stRenameUser,stRenameRole, stRenameJob,
      stRenameStore,stRenameModule,stRenameTextFilter,
      stRenameWordGenerator,stRenameMigrator,stRenameTable,
      stRenameView,stRenameIndex,stRenameTrigger, stRenameFunction,
      stRenameProcedure, stGrant,stRevoke, stRepairTable,stVerifyTable,
      stOptimizeTable,stEmptyTable, stExportTable,stImportTable,
      stSetBackupsStore,stBackupDatabase,stRestoreDatabase,
      stSetUpdatesStore, stSaveDatabaseUpdates,stLoadDatabaseUpdates,
      stPublishDatabase,stUnpublishDatabase, stSetMigrator,
      stMigrateDatabase, stDisconnectServerSession,
      stRemoveServerSession, stSetFilesStore,stCopyFile,stRenameFile,
      stDeleteFile, stSetInformationCollate,stCompareDatabase,
      stEnableJob,stEnableJobs,stEnableTrigger,stEnableTiggers,
      stEnableDefaults,stEnableGenerated,stEnableStatementLogging,
      stDisableJob,stDisableJobs,stDisableTrigger,stDisableTriggers,
      stDisableDefaults,stDisableGenerated,stDisableStatementLogging,
      stSetStatementCache,stSetProcedureCache)
```

This type is used to indicate the type of SQL statement in the TEDBQuery SQL property.

Element	Description
stAlterDatabase	Indicates an ALTER DATABASE statement.
stAlterFunction	Indicates an ALTER FUNCTION statement.
stAlterIndex	Indicates an ALTER INDEX statement.
stAlterJob	Indicates an ALTER JOB statement.
stAlterMigrator	Indicates an ALTER MIGRATOR statement.
stAlterModule	Indicates an ALTER MODULE statement.
stAlterProcedure	Indicates an ALTER PROCEDURE statement.
stAlterRole	Indicates an ALTER ROLE statement.
stAlterStore	Indicates an ALTER STORE statement.

stAlterTable	Indicates an ALTER TABLE statement.
stAlterTextFilter	Indicates an ALTER TEXT FILTER statement.
stAlterTrigger	Indicates an ALTER TRIGGER statement.
stAlterUser	Indicates an ALTER USER statement.
stAlterView	Indicates an ALTER VIEW statement.
stAlterWordGenerator	Indicates an ALTER WORD GENERATOR statement.
stBackupDatabase	Indicates a BACKUP DATABASE statement.
stCompareDatabase	Indicates a COMPARE DATABASE statement.
stCopyFile	Indicates a COPY FILE statement.
stCreateDatabase	Indicates a CREATE DATABASE statement.
stCreateFunction	Indicates a CREATE FUNCTION statement.
stCreateIndex	Indicates a CREATE INDEX statement.
stCreateJob	Indicates a CREATE JOB statement.
stCreateMigrator	Indicates a CREATE MIGRATOR statement.
stCreateModule	Indicates a CREATE MODULE statement.
stCreateProcedure	Indicates a CREATE PROCEDURE statement.
stCreateRole	Indicates a CREATE ROLE statement.
stCreateStore	Indicates a CREATE STORE statement.
stCreateTable	Indicates a CREATE TABLE statement.
stCreateTextFilter	Indicates a CREATE TEXT FILTER statement.
stCreateTextIndex	Indicates a CREATE TEXT INDEX statement.
stCreateTrigger	Indicates a CREATE TRIGGER statement.
stCreateUser	Indicates a CREATE USER statement.
stCreateView	Indicates a CREATE VIEW statement.
stCreateWordGenerator	Indicates a CREATE WORD GENERATOR statement.
stDelete	Indicates a DELETE statement.
stDeleteFile	Indicates a RENAME FILE statement.
stDisableDefaults	
stDisableGenerated	
stDisableJob	
stDisableJobs	
stDisableStatementLogging	
stDisableTrigger	
stDisableTriggers	
stDisconnectServerSession	Indicates a DISCONNECT SERVER SESSION statement.
stDropDatabase	Indicates a DROP DATABASE statement.

stDropFunction	Indicates a DROP FUNCTION statement.
stDropIndex	Indicates a DROP INDEX statement.
stDropJob	Indicates a DROP JOB statement.
stDropMigrator	Indicates a DROP MIGRATOR statement.
stDropModule	Indicates a DROP MODULE statement.
stDropProcedure	Indicates a DROP PROCEDURE statement.
stDropRole	Indicates a DROP ROLE statement.
stDropStore	Indicates a DROP STORE statement.
stDropTable	Indicates a DROP TABLE statement.
stDropTextFilter	Indicates a DROP TEXT FILTER statement.
stDropTrigger	Indicates a DROP TRIGGER statement.
stDropUser	Indicates a DROP USER statement.
stDropView	Indicates a DROP VIEW statement.
stDropWordGenerator	Indicates a DROP WORD GENERATOR statement.
stEmptyTable	Indicates an EMPTY TABLE statement.
stEnableDefaults	
stEnableGenerated	
stEnableJob	
stEnableJobs	
stEnableStatementLogging	
stEnableTiggers	
stEnableTrigger	
stExportTable	Indicates an EXPORT TABLE statement.
stGrant	Indicates a GRANT statement.
stImportTable	Indicates an IMPORT TABLE statement.
stInsert	Indicates an INSERT statement.
stLoadDatabaseUpdates	Indicates a LOAD UPDATES statement.
stMigrateDatabase	Indicates a MIGRATE DATABASE statement.
stOptimizeTable	Indicates an OPTIMIZE TABLE statement.
stPublishDatabase	Indicates a PUBLISH DATABASE statement.
stRemoveServerSession	Indicates a REMOVE SERVER SESSION statement.
stRenameDatabase	Indicates an RENAME DATABASE statement.
stRenameFile	Indicates a RENAME FILE statement.
stRenameFunction	Indicates an RENAME FUNCTION statement.
stRenameIndex	Indicates an RENAME INDEX statement.
stRenameJob	Indicates an RENAME JOB statement.

stRenameMigrator	Indicates an RENAME MIGRATOR statement.
stRenameModule	Indicates a RENAME MODULE statement.
stRenameProcedure	Indicates an RENAME PROCEDURE statement.
stRenameRole	Indicates an RENAME ROLE statement.
stRenameStore	Indicates an RENAME STORE statement.
stRenameTable	Indicates an RENAME TABLE statement.
stRenameTextFilter	Indicates an RENAME TEXT FILTER statement.
stRenameTrigger	Indicates an RENAME TRIGGER statement.
stRenameUser	Indicates an RENAME USER statement.
stRenameView	Indicates an RENAME VIEW statement.
stRenameWordGenerator	Indicates an RENAME WORD GENERATOR statement.
stRepairTable	Indicates a REPAIR TABLE statement.
stRestoreDatabase	Indicates a RESTORE DATABASE statement.
stRevoke	Indicates a REVOKE statement.
stSaveDatabaseUpdates	Indicates a SAVE UPDATES statement.
stSelect	Indicates a SELECT statement.
stSetBackupsStore	Indicates a SET BACKUPS STORE statement.
stSetFilesStore	Indicates a SET FILES STORE statement.
stSetInformationCollate	Indicates a SET INFORMATION COLLATE statement.
stSetMigrator	
stSetProcedureCache	
stSetStatementCache	
stSetUpdatesStore	Indicates a SET UPDATES STORE statement.
stUnknown	Indicates an unknown statement.
stUnpublishDatabase	Indicates an UNPUBLISH DATABASE statement.
stUpdate	Indicates an UPDATE statement.
stVerifyTable	Indicates a VERIFY TABLE statement.

7.39 TEDBStatusMessageEvent Type

Unit: edbcomps

```
TEDBStatusMessageEvent = procedure (Sender: TObject; const
      StatusMessage: String) of object
```

This type is used for the TEDBSession OnStatusMessage, TEDBDatabase OnStatusMessage, TEDBQuery OnStatusMessage, and TEDBStoredProc OnStatusMessage events.

7.40 TEDBStringsArray Type

Unit: edbtype

```
TEDBStringsArray = array of String
```

This type is a synonym for an array of Strings.

7.41 TEDBTime Type

Unit: edbtype

```
TEDBTime = Integer
```

This type is a synonym for the Integer type.

7.42 TEDBTimeStamp Type

Unit: edbtype

```
TEDBTimeStamp = Int64
```

This type is a synonym for the Int64 type.

7.43 TEDBYearMonthInterval Type

Unit: edbtype

```
TEDBYearMonthInterval = Integer
```

This type is a synonym for the Integer type.

7.44 TEDBYearMonthIntervalType Type

Unit: edbcomps

```
TEDBYearMonthIntervalType = (ymUnknown,ymYear,ymMonth,
      ymYearMonth)
```

This type indicates the type of day-time interval to use with the TEDBEngine YearMonthIntervalToSQLStr and SQLStrToYearMonthInterval methods. Please see the Interval Types topic for more information.

Element	Description
ymMonth	Indicates that the value is a month interval.
ymUnknown	Indicates that the value's interval type is unknown.
ymYear	Indicates that the value is a year interval.
ymYearMonth	Indicates that the value is a year-month interval.

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Appendix A - Error Codes and Messages

The following is a table of the error codes and messages for ElevateDB. ElevateDB uses the exception object to raise exceptions when an error occurs.

> **Note**
> This list only covers the exceptions raised by ElevateDB itself and does not cover the general exceptions raised by the component units.

If you wish to use the error constants defined by ElevateDB in your applications you need to make sure:

For Delphi applications, that the edberror unit file is included in your uses clause for the source unit in question

For C++Builder applications, that the edberror header file is included in your .h header file for the source file in question

If you wish to change the following error messages or translate them into a different language, you may do so by altering the contents of the edbconsts unit that can be found in the same directory where the other ElevateDB units were installed.

For more information on exception handling in your application, please see the Exception Handling and Errors topic in this manual.

Error Code	Message and Further Details
EDB_ERROR_VALIDATE (100)	There is an error in the metadata for the <ObjectType> <ObjectName> (<ErrorMessage>)This error is raised whenever an attempt is made to create a new catalog or configuration object, and there is an error in the specification of the object. The specific error message is indicated within the parentheses.
EDB_ERROR_UPDATE (101)	There was an error updating the <ObjectType> <ObjectName> (<ErrorMessage>)This error is raised whenever ElevateDB encounters an issue while trying to update the disk file used to store a catalog or configuration. The specific error message is indicated within the parentheses.
EDB_ERROR_SYSTEM (200)	This operation cannot be performed on the system <ObjectType> <ObjectName> or any privileges granted to itThis error is raised whenever an attempt is made to alter or drop any system-defined catalog or configuration objects. Please see the System Information topic for more information on the system-defined objects in ElevateDB.
EDB_ERROR_DEPENDENCY (201)	The <ObjectType> <ObjectName> cannot be dropped or moved because it is still referenced by the <ObjectType> <ObjectName>This error is raised whenever an attempt is made to drop any catalog or configuration object, and that catalog or configuration

	object is still being referenced by another catalog or configuration object. You must first remove the reference to the object that you wish to drop before you can drop the referenced object.
EDB_ERROR_MODULE (202)	An error occurred with the module <ModuleName> (<ErrorMessage>)This error is raised whenever ElevateDB encounters an issue with loading an external module. Please see the External Modules topic for more information.
EDB_ERROR_LOCK (300)	Cannot lock <ObjectType> <ObjectName> for <AccessType> accessThis error is raised whenever ElevateDB cannot obtain the desired lock access to a given object. This is usually due to another session already having an incompatible lock on the object already. Please see the Locking topic for more information.
EDB_ERROR_UNLOCK (301)	Cannot unlock <ObjectType> <ObjectName> for <AccessType> accessThis error is raised whenever ElevateDB cannot unlock a given object. If this error occurs during normal operation of ElevateDB, please contact Elevate Software for further instructions on how to correct the issue.
EDB_ERROR_EXISTS (400)	The <ObjectType> <ObjectName> already existsThis error is raised whenever an attempt is made to create a new catalog or configuration object, and a catalog or configuration object already exists with that name.
EDB_ERROR_NOTFOUND (401)	The <ObjectType> <ObjectName> does not existThis error is raised when an attempt is made to open/execute, alter, or drop a catalog or configuration object that does not exist.
EDB_ERROR_NOTOPEN (402)	The database <DatabaseName> must be open in order to perform this operation (<OperationName>)This error is raised when an attempt is made to perform an operation on a given database before it has been opened.
EDB_ERROR_READONLY (403)	The <ObjectType> <ObjectName> is read-only and this operation cannot be performed (<OperationName>)This error is raised whenever a create, alter, or drop operation is attempted on an object that is read-only.
EDB_ERROR_TRANS (404)	Transaction error (This operation cannot be performed while the database <DatabaseName> has an active transaction (<OperationName>))This error is raised whenever ElevateDB encounters an invalid transaction operation. Some SQL statements cannot be executed within a transaction. For a list of transaction-compatible statements, please see the Transactions topic.
EDB_ERROR_MAXIMUM (405)	The maximum number of <ObjectType>s has been reached (<MaximumObjectsAllowed>)This error is raised when an attempt is made to create a new catalog or configuration object and doing so would exceed the maximum allowable number of objects. Please see the

	Appendix B - System Capacities topic for more information.
EDB_ERROR_IDENTIFIER (406)	Invalid <ObjectType> identifier '<ObjectName>'This error is raised when an attempt is made to create a new catalog or configuration object with an invalid name. Please see the Identifiers topic for more information on what constitutes a valid identifier.
EDB_ERROR_FULL (407)	The table <TableName> is full (<FileName>)This error occurs when a given table contains the maximum number of rows or the maximum file size is reached for one of the files that make up the table. The file name is indicated within the parentheses.
EDB_ERROR_CONFIG (409)	There is an error in the configuration (<ErrorMessage>)This error is raised whenever there is an error in the configuration. The specific error message is indicated within the parentheses.
EDB_ERROR_NOLOGIN (500)	A user must be logged in in order to perform this operation (<OperationName>)This error is raised whenever an attempt is made to perform an operation for a session that has not been logged in yet with a valid user name and password.
EDB_ERROR_LOGIN (501)	Login failed (<ErrorMessage>)This error is raised whenever a user login fails. ElevateDB allows for a maximum of 3 login attempts before raising a login exception.
EDB_ERROR_ADMIN (502)	Administrator privileges are required to perform this operation (<Operation>)This error is raised when an attempt is made to perform an operation that requires administrator privileges. Administrator privileges are granted to a given user by granting the system-defined "Administrators" role to that user. Please see the User Security topic for more information.
EDB_ERROR_PRIVILEGE (503)	The current user does not have the proper privileges to perform this operation (<OperationName>)This error is raised when a user attempts an operation when he/she does not have the proper privileges required to execute the operation. Please see the User Security topic for more information.
EDB_ERROR_MAXSESSIONS (504)	Maximum number of concurrent sessions reached for the configuration <ConfigurationName>This error is raised when the maximum number of licensed sessions for a given configuration is exceeded. The number of licensed sessions for a given configuration depends upon the ElevateDB product purchased along with the particular compilation of the application made by the developer using the ElevateDB product.
EDB_ERROR_SERVER (505)	The ElevateDB Server cannot be started (<ErrorMessage>) The ElevateDB Server cannot be stopped (<ErrorMessage>)This error is raised when the ElevateDB Server cannot be started or stopped for any

	reason. Normally, the error message will contain a native operating system error message that will reveal the reason for the issue.
EDB_ERROR_FILEMANAGER (600)	File manager error (<ErrorMessage>)This error is raised whenever ElevateDB encounters a file manager error while trying to create, open, close, delete, or rename a file. The specific error message, including operating system error code (if available), is indicated within the parentheses.
EDB_ERROR_CORRUPT (601)	The table <TableName> is corrupt (<ErrorMessage>)This error is raised when ElevateDB encounters an issue while reading, writing, or validating a table. If this error occurs during normal operation of ElevateDB, please contact Elevate Software for further instructions on how to correct the issue. The specific error message is indicated within the parentheses.
EDB_ERROR_COMPILE (700)	An error was found in the <ObjectType> at line <Line> and column <Column> (<ErrorMessage>)This error is raised whenever an error is encountered while compiling an SQL expression, statement, or routine. The specific error message is indicated within the parentheses.
EDB_ERROR_BINDING (800)	A row binding error occurredThis error is raised when ElevateDB encounters an issue while trying to bind the cursor row values in a cursor row. It is an internal error and will not occur unless there is a bug in ElevateDB.
EDB_ERROR_STATEMENT (900)	An error occurred with the statement <StatementName> (<ErrorMessage>)This error is raised whenever an issue is encountered while executing a statement. The specific error message is indicated within the parentheses.
EDB_ERROR_PROCEDURE (901)	An error occurred with the procedure <ProcedureName> (<ErrorMessage>)This error is raised whenever an issue is encountered while executing a procedure. The specific error message is indicated within the parentheses.
EDB_ERROR_VIEW (902)	An error occurred with the view <ViewName> (<ErrorMessage>)This error is raised whenever an issue is encountered while opening a view. The specific error message is indicated within the parentheses.
EDB_ERROR_JOB (903)	An error occurred with the job <JobName> (<ErrorMessage>)This error is raised whenever an issue is encountered while running a job. The specific error message is indicated within the parentheses.
EDB_ERROR_IMPORT (904)	Error importing the file <FileName> into the table <TableName> (<ErrorMessage>)This error is raised when an error occurs during the import process for a given table. The specific error message is indicated within the parentheses.

EDB_ERROR_EXPORT (905)	Error exporting the table <TableName> to the file <FileName> (<ErrorMessage>)This error is raised when an error occurs during the export process for a given table. The specific error message is indicated within the parentheses.
EDB_ERROR_CURSOR (1000)	An error occurred with the cursor <CursorName> (<ErrorMessage>)This error is raised whenever an issue is encountered while operating on a cursor. The specific error message is indicated within the parentheses.
EDB_ERROR_FILTER (1001)	A filter error occurred (<ErrorMessage>)This error is raised whenever ElevateDB encounters an issue while trying to set or clear a filter on a given cursor. The specific error message is indicated within the parentheses.
EDB_ERROR_LOCATE (1002)	A locate error occurred (<ErrorMessage>)This error is raised whenever ElevateDB encounters an issue while trying to locate a row in a given cursor. The specific error message is indicated within the parentheses.
EDB_ERROR_STREAM (1003)	An error occurred in the cursor stream (<ErrorMessage>)This error is raised whenever an issue is encountered while loading or saving a cursor to or from a stream. The specific error message is indicated within the parentheses.
EDB_ERROR_CONSTRAINT (1004)	The constraint <ConstrainName> has been violated (<ErrorMessage>)This error is raised when a constraint that has been defined for a table is violated. This includes primary key, unique key, foreign key, and check constraints. The specific error message is indicated within the parentheses.
EDB_ERROR_LOCKROW (1005)	Cannot lock the row in the table <TableName>This error is raised when a request is made to lock a given row and the request fails because another session has the row already locked. Please see the Locking topic for more information.
EDB_ERROR_UNLOCKROW (1006)	Cannot unlock the row in the table <TableName>This error is raised whenever ElevateDB cannot unlock a specific row because the row had not been previously locked, or had been locked and the lock has since been cleared. Please see the Locking topic for more information.
EDB_ERROR_ROWDELETED (1007)	The row has been deleted since last cached for the table <TableName>This error is raised whenever an attempt is made to update or delete a row, and the row no longer exists because it has been deleted by another session. Please see the Updating Rows topic for more information.
EDB_ERROR_ROWMODIFIED (1008)	The row has been modified since last cached for the table <TableName>This error is raised whenever an attempt is made to update or delete a row, and the row has been updated by another session since the last time it was cached by the current session. Please see the

	Updating Rows topic for more information.
EDB_ERROR_CONSTRAINED (1009)	The cursor is constrained and this row violates the current cursor constraint condition(s)This error is raised when an attempt is made to insert a new row into a constrained cursor that violates the filter constraints defined for the cursor. Both views defined in database catalogs and the result sets of dynamic queries can be defined as constrained, and the filter constraints in both cases are the WHERE conditions defined for the underlying SELECT query that the view or dynamic query is based upon.
EDB_ERROR_ROWVISIBILITY (1010)	The row is no longer visible in the table <TableName>This error is raised whenever an attempt is made to update or delete a row within the context of a cursor with an active filter or range condition, and the row has been updated by another session since the last time it was cached by the current session, thus causing it to fall out of the scope of the cursor's active filter or range condition. Please see the Updating Rows topic for more information.
EDB_ERROR_VALUE (1011)	An error occurred with the <ObjectType> <ObjectName> (<ErrorMessage>)This error is raised whenever an attempt is made to store a value in a column, parameter, or variable and the value is invalid because it is out of range or would be truncated. The specific error message is indicated within the parentheses.
EDB_ERROR_ROWCORRUPTED (1012)	The row has been corrupted since last cached for the table <TableName>This error is raised whenever an attempt is made to update or delete a row, and the row buffer being used for the operation has been corrupted. This is typically due to improper multi-threaded access to the ElevateDB client engine.
EDB_ERROR_CLIENTCONN (1100)	A connection to the server at <ServerAddress> cannot be established (<ErrorMessage>)This error is raised when ElevateDB encounters an issue while trying to connect to a remote ElevateDB Server. The error message will indicate the reason why the connection cannot be completed.
EDB_ERROR_CLIENTLOST (1101)	A connection to the server at <ServerAddress> has been lost <ErrorMessage>)This error is raised when ElevateDB encounters an issue while connected to a remote ElevateDB Server. The error message will indicate the reason why the connection was lost.
EDB_ERROR_INVREQUEST (1103)	An invalid or unknown request was sent to the serverThis error is raised when an ElevateDB Server encounters an unknown request from a client session.
EDB_ERROR_ADDRBLOCK (1104)	The IP address <IPAddress> is blockedThis error is raised when a session tries to connect to an ElevateDB Server, and the originating IP address for the session matches one of the configured blocked IP addresses in the ElevateDB Server, or does not match one of the

	configured authorized IP addresses in the ElevateDB Server.
EDB_ERROR_ENCRYPTREQ (1105)	An encrypted connection is requiredThis error is raised when a non-encrypted session tries to connect to an ElevateDB Server that has been configured to only accept encrypted session connections.
EDB_ERROR_SESSIONNOTFOUND (1107)	The session ID <SessionID> is no longer present on the serverThis error is raised whenever a remote session attempts to reconnect to a session that has already been designated as a dead session and removed by the ElevateDB Server. This can occur when a session is inactive for a long period of time, or when the ElevateDB Server has been stopped and then restarted.
EDB_ERROR_SESSIONCURRENT (1108)	The current session ID <SessionID> cannot be disconnected or removedThis error is raised whenever a remote session attempts to disconnect or remove itself.
EDB_ERROR_COMPRESS (1200)	An error occurred while compressing data (<ErrorMessage>)This error is raised when ElevateDB encounters an issue while attempting to compress data. It is an internal error and will not occur unless there is a bug in ElevateDB. The specific error message is indicated within the parentheses.
EDB_ERROR_DECOMPRESS (1201)	An error occurred while uncompressing data (<ErrorMessage>)This error is raised when ElevateDB encounters an issue while attempting to decompress data. It is an internal error and will not occur unless there is a bug in ElevateDB. The specific error message is indicated within the parentheses.
EDB_ERROR_BACKUP (1300)	Error backing up the database <DatabaseName> (<ErrorMessage>)This error is raised when any error occurs during the backing up of a database. The specific error message is indicated within the parentheses.
EDB_ERROR_RESTORE (1301)	Error restoring the database <DatabaseName> (<ErrorMessage>)This error is raised when any error occurs during the restore of a database. The specific error message is indicated within the parentheses.
EDB_ERROR_PUBLISH (1302)	Error backing up the database <DatabaseName> (<ErrorMessage>)This error is raised when any error occurs during the backing up of a database. The specific error message is indicated within the parentheses.
EDB_ERROR_UNPUBLISH (1303)	Error unpublishing the database <DatabaseName> (<ErrorMessage>)This error is raised when any error occurs during the unpublishing of a database. The specific error message is indicated within the parentheses.
EDB_ERROR_SAVEUPDATES (1304)	Error saving updates for the database <DatabaseName> (<ErrorMessage>)This error is raised when any error occurs during the saving of the updates for a database. The specific error message is indicated within the parentheses.

EDB_ERROR_LOADUPDATES (1305)	Error loading updates for the database <DatabaseName> (<ErrorMessage>)This error is raised when any error occurs during the loading of the updates for a database. The specific error message is indicated within the parentheses.
EDB_ERROR_STORE (1306)	Error with the store <StoreName> (<ErrorMessage>)This error is raised when any error occurs while trying to access a store, such as a read or write error while working with files in the store. The specific error message is indicated within the parentheses.
EDB_ERROR_CACHEUPDATES (1307)	Error caching updates for the cursor <CursorName> (<ErrorMessage>)This error is raised when any error occurs during the caching of updates for a specific table, view, or query cursor. The specific error message is indicated within the parentheses.
EDB_ERROR_FORMAT (1400)	Error in the format string <FormatString> (<ErrorMessage>)This error is raised when ElevateDB encounters an issue with a format string used in a date, time, or timestamp format used in a table import or export. The specific error message is indicated within the parentheses.

Appendix B - System Capacities

The following is a list of the capacities for the different objects in ElevateDB. Any object that is not specifically mentioned here has an implicit capacity of 2147483647, or High(Integer). For example, there is no stated capacity for the maximum number of roles allowed in a configuration. Therefore, the implicit capacity is 2147483647 roles.

Capacity	Details
Max BLOB Column Size	The maximum size of a BLOB column is 2GB.
Max CHAR/VARCHAR Column Length	The maximum length of a VARCHAR/CHAR columns is 1024 characters.
Max Identifier Length	The maximum length of an identifier is 80 characters.
Max Number of Columns in a Table	The maximum number of columns in a table is 2048.
Max Number of Columns in an Index	The maximum number of columns in an index is limited by the table's defined index page size.
Max Number of Concurrent Sessions	The maximum number of concurrent sessions for an application or ElevateDB server is 4096.
Max Number of Indexes in a Table	The maximum number of indexes in a table is 512.
Max Number of Jobs in a Configuration	The maximum number of jobs in a configuration is 4096.
Max Number of Routines in a Database	The maximum number of routines (procedures and functions combined) in a database is 4096.
Max Number of Rows in a Table	The maximum number of rows in a table is determined by whether global file I/O buffering is enabled in ElevateDB. If global file I/O buffering is enabled, then the maximum number of rows is determined by the maximum file size permitted in the operating system. If global file I/O buffering is not enabled, then the approximate maximum number of rows can be determined by dividing 128GB by the row size.
Max Number of Rows in a Transaction	The maximum number of rows in a single transaction is only limited by the available memory constraints of the operating system and/or hardware.
Max Number of Tables in a Database	The maximum number of tables in a database is 4096.
Max Number of Users in a Configuration	The maximum number of users in a configuration is 4096.
Max Row Size for a Table	The maximum row size for a table is 2GB.
Max Scale for DECIMAL or NUMERIC Columns	The maximum scale for DECIMAL or NUMERIC columns is 4.
Max Size of an In-Memory Table	The maximum size of an in-memory table is only limited by the available memory constraints of the operating system or hardware.
Min/Max BLOB Block Size for a Table	The minimum BLOB block size is 64 bytes for ANSI databases and 128 bytes for Unicode databases. The maximum BLOB block size is 2GB.

Min/Max Index Page Size for a Table	The minimum index page size is 1 kilobyte for ANSI databases and 2 kilobytes for Unicode databases. The maximum index page size is 2GB.