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# InterBase Encryption - How to Get Started?

(https://blogs.embarcadero.com/author/fernandorizzato/) By Rizzato Fernando (https://blogs.embarcadero.com/author/fernandorizzato/) - June 20, 2024



High-level encryption is a vital feature of any reliable database, and Embarcadero's signature database, InterBase, handles it very well. But how exactly does InterBase restrict access to data, both at rest and in transit, through encryption? In the article we are taking a closer look.

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- Database Level Encryption (InterBase encrypts all of the database pages that contain user information).
- Column Level Encryption (Column-level encryption is more flexible and specific to the selected data columns).

Using **Encryption Engine** you can also encrypt Database Backup Files. For more information about encrypting your data with InterBase, see <u>Data Definition Guide</u> (https://docwiki.embarcadero.com/InterBase/2020/en/Data\_Definition\_Guide).

# **Getting Started With InterBase Encryption Engine**

To create specific encryption tasks in InterBase, you need to create the System Data Security Owner (SYSDSO) user. Both users, the SYSDSO and the SYSDBA (the database owner), have responsibilities for InterBase Encryption. The table below shows the differences between the user's tasks:

Permissions	Database Owner	SYSDS0
Create Encryption Keys	NO	YES
Set the SEP	NO	YES
Grant Encrypt Privileges	NO	YES
Encrypt Database	YES	NO
Encrypt Columns	YES	NO
Grant Decrypt Privileges	YES	NO

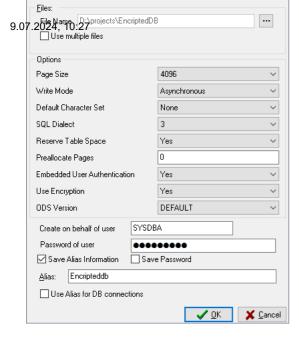
Also, encryption tasks can be performed by any individual table owner who is given permission to encrypt columns in a table.

# **Encrypting a Database with IBConsole**

There are two ways to encrypt an InterBase database. You can enable and implement encryption using the **isql** tool, or you can encrypt a database using the **IBConsole**. For this specific topic, we use the second option – **Encrypting a Database with IBConsole**.

To perform encryption when creating a new database, follow these steps:

- 1. Open IBConsole.
- 2. Select **Server > Login** from the menu.
- 3. Login as a SYSDBA or as a database owner.
- 4. Select Database > Create Database from the menu.
- 5. In the Save In field, select the folder where you want to save the database.
- 6. Specify a file name, click Save, and the dialog closes.
- 7. Change the value in the Embedded User Authentication field to Yes. (The Use Encryption field is now visible)
- 8. Change the value in the Use Encryption field to Yes.

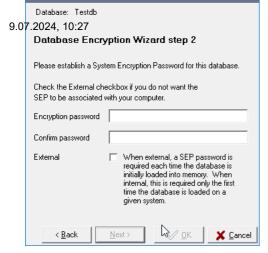


- 9. Click OK to create a database. The database is created and the Encryption Wizard opens.
- 10. Enter your connection information and click the Connect button.
- 11. The database is created and the Encryption Wizard opens; click Next.



12. Type the SYSDSO password and click the Next button.





**Note**: The **External** option makes it more difficult for unauthorized users to access an encrypted database on a mobile device such as a laptop computer, or on a poorly secured desktop computer.

- 14. Type a name for the Encryption Key.
- 15. Select one of the Cipher options.
- 16. Click the OK button.



17. Type the BackupKey Name and password.



Note: To maintain the security and confidentiality of encrypted databases, you must also encrypt database backup files.

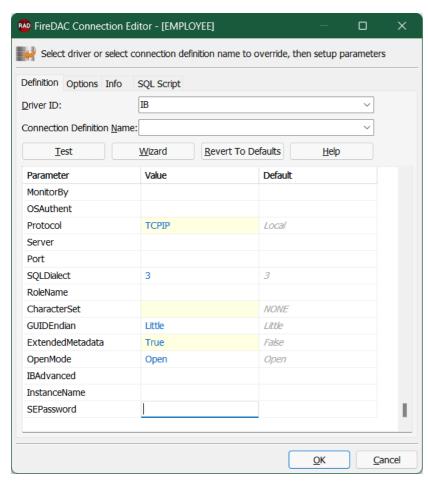
9.07.2024 he internal SEP allows the database to be accessed by the untabase users when someone has used the database once with the SEP on the machine. Subsequent connections or a connection after a machine reboot do not need to provide the SEP value. If the RAD Studio application is deployed to Mac or to a mobile device then the first connection requires the SEP parameter value.

• The database set with **external SEP** requires the first connection to have the **SEP** parameter value. After you reboot the machine, the application needs to provide the **SEP** at the first connection. The external **System Encryption Password** is safer for mobile devices.

Note: To set the external SEP, check the External option in the Encryption wizard or you can use the *alter database set system encryption password* <255-character string> [external] command.

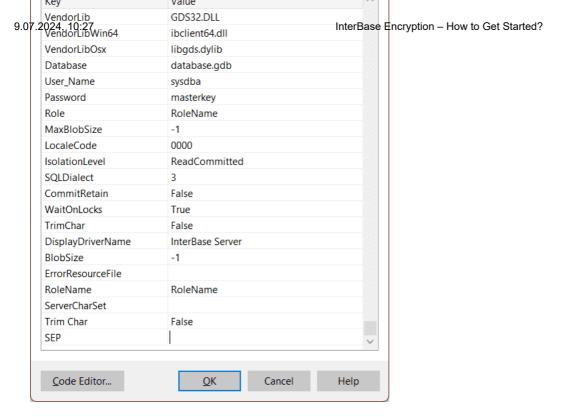
# System Encryption Password in FireDAC

With FireDAC, you can set the SEPassword parameter in the <u>TFDConnection connection definition parameters</u> (<a href="https://docwiki.embarcadero.com/RADStudio/en/Connect\_to\_InterBase\_(FireDAC)">https://docwiki.embarcadero.com/RADStudio/en/Connect\_to\_InterBase\_(FireDAC)</a>), or programmatically as well:



### System Encryption Password in dbExpress

With dbExpress, you can set the SEP value in the <u>TSQLConnection (https://docwiki.embarcadero.com/Libraries/en/Data.SqlExpr.TSQLConnection)</u>. Params collection, or you can set the SEP value programmatically.



```
procedure TForm10.BtnConnectClick(Sender: T0bject);
begin

rry
SQLConnection1.Params.Values['SEP']:='password';
SQLConnection1.Connected:=true;
except
on E:Exception do
ShowMessage(E.ClassName + ' ' + E.Message);
end;
lo end;
```

# System Encryption Password in InterBase Express

With InterBase Express (IBX), the SysEncryptPassword <u>TIBDatabase (https://docwiki.embarcadero.com/Libraries/en/IBX.IBDatabase.TIBDatabase)</u> parameter is set programmatically:

```
procedure TForm10.BtnConnectClick(Sender: TObject);
begin

try

IBDatabase1.SysEncryptPassword:='password';
IBDatabase1.Open;
except
on E:Exception do
ShowMessage(E.ClassName + ' ' + E.Message);
end;
end;
```

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