

[DATABASE \(HTTPS://BLOGS.EMBARCADERO.COM/CATEGORY/DATABASE/\)](https://blogs.embarcadero.com/category/database/) [INTERBASE \(HTTPS://BLOGS.EMBARCADERO.COM/CATEGORY/INTERBASE/\)](https://blogs.embarcadero.com/category/interbase/)
[NEWS \(HTTPS://BLOGS.EMBARCADERO.COM/CATEGORY/NEWS/\)](https://blogs.embarcadero.com/category/news/)

InterBase Encryption – How to Get Started?



[\(https://blogs.embarcadero.com/author/fernandorizzato/\)](https://blogs.embarcadero.com/author/fernandorizzato/) By Rizzato Fernando [\(https://blogs.embarcadero.com/author/fernandorizzato/\)](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.

Table of Contents

- [Introduction](#)
- [Getting Started With InterBase Encryption Engine](#)
- [Encrypting a Database with IBConsole](#)
- [Using the System Encryption Password parameter](#)
 - [System Encryption Password in FireDAC](#)
 - [System Encryption Password in dbExpress](#)
 - [System Encryption Password in InterBase Express](#)
- [Curious About InterBase?](#)

- 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 [Data Definition Guide](https://docwiki.embarcadero.com/InterBase/2020/en/Data_Definition_Guide) (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 | SYSDSO |
|--------------------------|----------------|--------|
| 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**.



9.07.2024, 10:27

Files: D:\projects\EncryptedDB ...

☐ Use multiple files

Options

Page Size: 4096

Write Mode: Asynchronous

Default Character Set: None

SQL Dialect: 3

Reserve Table Space: Yes

Preallocate Pages: 0

Embedded User Authentication: Yes

Use Encryption: Yes

ODS Version: DEFAULT

Create on behalf of user: SYSDBA

Password of user:

☒ Save Alias Information ☐ Save Password

Alias: Encrypteddb

☐ Use Alias for DB connections

InterBase Encryption – How to Get Started?

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

Encryption Wizard

Database: Encrypted

Welcome to the Database Encryption Wizard

The Database Encryption Wizard will guide you through the creation of an encryption key which will then be used to perform database-level encryption on this database.

The steps are:

1. Provide SYSDSO Password (optional)
2. Establish a System Encryption Password
3. Specify a name and options for the encryption key
4. Create a backup key if necessary

Click the "Next" button to begin.

- Type the **SYSDSO** password and click the **Next** button.

Encryption Wizard

Database: Testdb

Database Encryption Wizard step 1

The first step is creating account for SYSDSO.
To continue, please provide the SYSDSO password.

SYSDSO Password:

Confirm Password:

No Password: ☐

No password makes it easier for the account creator to temporarily acquire SYSDSO privileges to create and test encryptions during development without having to login to do so. When the SYSDSO password is subsequently changed, the account creator loses this privilege. Presumably, this handoff would occur at deployment time, when transferring these duties to a security authority.



Database: Testdb

Database Encryption Wizard step 2

Please establish a System Encryption Password for this database.

Check the External checkbox if you do not want the SEP to be associated with your computer.

Encryption password

Confirm password

External ☐ When external, a SEP password is required each time the database is initially loaded into memory. When internal, this is required only the first time the database is loaded on a given system.

< Back

Next >

☒ OK

☐ Cancel

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.

Encryption Wizard

Database: Testdb

Database Encryption Wizard step 3

Specify a name and the options for the encryption key.

Encryption name

Use Case Sensitive name ☐ Default Key ☐

with Grant Option ☐

Options

Cipher

Key bit length

Init vector

Padding

< Back

Next >

☒ OK

☐ Cancel

- 17. Type the BackupKey Name and password.

Encryption Wizard

Database: Testdb

Database Encryption Wizard step 4

To be able to backup and restore the encrypted database you need to create a password protected key.

You can create it now by specifying a name for it and supplying a password. The Cipher and other parameters of step 3 will be used to create the key.

Backupkey Name

☐ Case sensitive name

Password

Confirm Password

< Back

Next >

☒ OK

☐ Cancel



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

- The **internal SEP** allows the database to be accessed by the database 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 [TFDConnection connection definition parameters](#) ([https://docwiki.embarcadero.com/RADStudio/en/Connect_to_InterBase_\(FireDAC\)\)](https://docwiki.embarcadero.com/RADStudio/en/Connect_to_InterBase_(FireDAC))), or programmatically as well:

FireDAC Connection Editor - [EMPLOYEE]

Select driver or select connection definition name to override, then setup parameters

DefinitionOptionsInfoSQL Script

Driver ID:IB

Connection Definition Name:

TestWizardRevert To DefaultsHelp

| Parameter | Value | Default |
|------------------|--------|---------|
| MonitorBy | | |
| OSAuthent | | |
| Protocol | TCPIP | Local |
| Server | | |
| Port | | |
| SQLDialect | 3 | 3 |
| RoleName | | |
| CharacterSet | | NONE |
| GUIDEndian | Little | Little |
| ExtendedMetadata | True | False |
| OpenMode | Open | Open |
| IBAdvanced | | |
| InstanceName | | |
| SEPassword | | |

OKCancel

```
1 procedure TForm10.BtnConnectClick(Sender: TObject);
2 begin
3   try
4     FDConnection1.Params.Values['SEPasword'] := 'password';
5     FDConnection1.Connected := true;
6   except
7     on E:Exception do
8       ShowMessage(E.ClassName + ' ' + E.Message);
9   end;
10 end;
```

System Encryption Password in dbExpress

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



| Key | Value |
|-------------------|------------------|
| VendorLib | GDS32.DLL |
| VendorLibWin64 | ibclient64.dll |
| VendorLibOsx | libgds.dylib |
| Database | database.gdb |
| User_Name | sysdba |
| Password | masterkey |
| Role | RoleName |
| MaxBlobSize | -1 |
| LocaleCode | 0000 |
| IsolationLevel | ReadCommitted |
| SQLDialect | 3 |
| CommitRetain | False |
| WaitOnLocks | True |
| TrimChar | False |
| DisplayDriverName | InterBase Server |
| BlobSize | -1 |
| ErrorResourceFile | |
| RoleName | RoleName |
| ServerCharSet | |
| Trim Char | False |
| SEP | |

Code Editor...
OK
Cancel
Help

```

1 procedure TForm10.BtnConnectClick(Sender: TObject);
2 begin
3   try
4     SQLConnection1.Params.Values['SEP'] := 'password';
5     SQLConnection1.Connected := true;
6   except
7     on E:Exception do
8       ShowMessage(E.ClassName + ' ' + E.Message);
9   end;
10 end;
```

System Encryption Password in InterBase Express

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

```

1 procedure TForm10.BtnConnectClick(Sender: TObject);
2 begin
3   try
4     IBDatabase1.SysEncryptPassword := 'password';
5     IBDatabase1.Open;
6   except
7     on E:Exception do
8       ShowMessage(E.ClassName + ' ' + E.Message);
9   end;
10 end;
```

Curious About InterBase?

- [Download The Free Developer Version \(https://www.embarcadero.com/products/interbase/developer/free-download\)](https://www.embarcadero.com/products/interbase/developer/free-download)
- [Download The Full Version Trial \(https://www.embarcadero.com/products/interbase/start-for-free\)](https://www.embarcadero.com/products/interbase/start-for-free)



What's New in RAD Studio 12.1 Athens

InterBase Encryption – How to Get Started?



Nuno Castro



Kyle Wheeler



Marco Cantu



David Millington



Ian Barker

WATCH REPLAY

(<https://youtu.be/8NjEEy-uFU>).

Reduce development time and get to market faster with RAD Studio, Delphi, or C++Builder.

Design. Code. Compile. Deploy.

START FREE TRIAL ([HTTPS://WWW.EMBARCADERO.COM/PRODUCTS/RAD-STUDIO/START-FOR-FREE](https://www.embarcadero.com/products/rad-studio/start-for-free))

UPGRADE TODAY ([HTTPS://WWW.EMBARCADERO.COM/APP-DEVELOPMENT-TOOLS-STORE/](https://www.embarcadero.com/app-development-tools-store/))

FREE DELPHI COMMUNITY EDITION ([HTTPS://WWW.EMBARCADERO.COM/PRODUCTS/DELPHI/STARTER](https://www.embarcadero.com/products/delphi/starter))

FREE C++BUILDER COMMUNITY EDITION ([HTTPS://WWW.EMBARCADERO.COM/PRODUCTS/CBUILDER/STARTER](https://www.embarcadero.com/products/cbuilder/starter))

0 (<https://blogs.embarcadero.com/interbase-encryption-how-to-get-started/#respond>)

1924

(mailto:?)
subject=InterBase Encryption –
How to Get Started?
(<https://blogs.embarcadero.com/interbase-encryption-how-to-get-started/>)
to- to- to- to- to-
get-get-get-get-get-
started/started/started/



blogs.embarcadero.com/author/fernandorizzato/

ABOUT AUTHOR

Rizzato Fernando

(<https://blogs.embarcadero.com/author/fernandorizzato/>)

Lead Software Consultant, LatAm

[f.\(http://fb.com/fernando.luiz.rizzato\)](http://fb.com/fernando.luiz.rizzato) [t.\(http://twitter.com/FernandoRizzato\)](http://twitter.com/FernandoRizzato) [in.\(http://linkedin.com/in/fernandorizzato\)](http://linkedin.com/in/fernandorizzato)

^

Leave a Reply

This site uses Akismet to reduce spam. [Learn how your comment data is processed \(https://akismet.com/privacy/\)](https://akismet.com/privacy/).

Join Our Global Developer Community

Join our email list and receive the latest case studies, event updates, product news, and much more.

Enter your email

SIGN UP

Reduce development time and get to market faster with RAD Studio, Delphi, or C++Builder.
Design. Code. Compile. Deploy.

START FREE TRIAL (HTTPS://WWW.EMBARCADERO.COM/PRODUCTS/RAD-STUDIO/START-FOR-FREE)

UPGRADE TODAY (HTTPS://WWW.EMBARCADERO.COM/APP-DEVELOPMENT-TOOLS-STORE/)

FREE DELPHI COMMUNITY EDITION (HTTPS://WWW.EMBARCADERO.COM/PRODUCTS/DELPHI/STARTER)

FREE C++BUILDER COMMUNITY EDITION (HTTPS://WWW.EMBARCADERO.COM/PRODUCTS/CBUILDER/STARTER)





(<https://lp.embarcadero.com/Object-Pascal-Handbook-2021>)

DOWNLOAD NOW! (<https://lp.embarcadero.com/object-pascal-handbook-2021>)



(<https://www.youtube.com/watch?v=BcjelDL82J4>)

WATCH NOW! (<https://www.youtube.com/watch?v=BCJELDL82J4>)

Search

SEARCH

Something Fresh

([https://blogs.er
delphi-htmx-in-
wordpress-](https://blogs.embarcadero.com/running-delphi-and-hmx-in-wordpress-htmx-series-part-3/)

Running Delphi & HMX in WordPress - HMX series part 3 (<https://blogs.embarcadero.com/running-delphi-and-hmx-in-wordpress-htmx-series-part-3/>)

July 5, 2024

^

(<https://blogs.ero.com/interbase-odbc-driver-on-github/>)


InterBase ODBC Driver on GitHub (<https://blogs.embarcadero.com/interbase-odbc-driver-on-github/>)

odbc-driver-on-github/)

June 28, 2024

Popular Posts

InterBase ODBC Driver on GitHub
(<https://blogs.embarcadero.com/interbase-odbc-driver-on-github/>)




(<https://blogs.embarcadero.com/author/marcocantu/>)

By Marco Cantu
(<https://blogs.embarcadero.com/author/marcocantu/>) -

June 28, 2024

(<https://blogs.embarcadero.com/embarcadero-partners-with-raize-software-for-ksvc-maintenance/>)




(<https://blogs.embarcadero.com/author/marcocantu/>)

By Marco Cantu
(<https://blogs.embarcadero.com/author/marcocantu/>) -

June 28, 2024

C++
New in RAD Studio 12.1: Split Editor Views!
(<https://blogs.embarcadero.com/new-in-rad-studio-12-1-split-editor-views/>)



(<https://blogs.embarcadero.com/author/davidmillington/>)

By David Millington
(<https://blogs.embarcadero.com/author/davidmillington/>)

May 2, 2024

Av
(<https://blogs.embarcadero.com/author/davidmillington/>)

By David Millington
(<https://blogs.embarcadero.com/author/davidmillington/>)

April

Categories

| | |
|--|------|
| BUSINESS DEVELOPMENT (https://blogs.embarcadero.com/category/news/business-development/) | 4 |
| C++ (https://blogs.embarcadero.com/category/cpp/) | 941 |
| CASE STUDY (https://blogs.embarcadero.com/category/case-study/) | 23 |
| CODE (https://blogs.embarcadero.com/category/code/) | 606 |
| CONTEST (https://blogs.embarcadero.com/category/news/contest/) | 2 |
| DATABASE (https://blogs.embarcadero.com/category/database/) | 141 |
| DELPHI (https://blogs.embarcadero.com/category/delphi/) | 1600 |
| DEVELOPER INTERVIEWS (https://blogs.embarcadero.com/category/developer-interviews/) | 21 |
| EVENT (https://blogs.embarcadero.com/category/news/event/) | 6 |
| FIREMONKEY (https://blogs.embarcadero.com/category/firemonkey/) | 15 |
| HOW-TO'S (https://blogs.embarcadero.com/category/news/how-tos/) | 20 |
| IDE (https://blogs.embarcadero.com/category/ide/) | 261 |

https://blogs.embarcadero.com/interbase-encryption-how-to-get-started/?utm_source=Eloqua&utm_medium=email&utm_content=Article-24070...

10/12

| | |
|--|--|
| INTERVIEW (HTTPS://BLOGS.EMBARCADERO.COM/CATEGORY/INTERVIEW/) | 51 |
| 9.07.2024, 10:27 | InterBase Encryption – How to Get Started? |
| MODERNIZATION (HTTPS://BLOGS.EMBARCADERO.COM/CATEGORY/MODERNIZATION/) | 16 |
| NEWS (HTTPS://BLOGS.EMBARCADERO.COM/CATEGORY/NEWS/) | 997 |
| PRODUCTIVITY (HTTPS://BLOGS.EMBARCADERO.COM/CATEGORY/NEWS/PRODUCTIVITY/) | 25 |
| PYTHON (HTTPS://BLOGS.EMBARCADERO.COM/CATEGORY/PYTHON/) | 14 |
| RAD SERVER (HTTPS://BLOGS.EMBARCADERO.COM/CATEGORY/RAD-SERVER/) | 6 |
| RAD STUDIO (HTTPS://BLOGS.EMBARCADERO.COM/CATEGORY/RAD-STUDIO/) | 718 |
| RESEARCH (HTTPS://BLOGS.EMBARCADERO.COM/CATEGORY/NEWS/RESEARCH/) | 11 |
| SHOWCASE (HTTPS://BLOGS.EMBARCADERO.COM/CATEGORY/SHOWCASE/) | 292 |
| TECH PARTNER (HTTPS://BLOGS.EMBARCADERO.COM/CATEGORY/TECH-PARTNER/) | 187 |
| WEBINAR (HTTPS://BLOGS.EMBARCADERO.COM/CATEGORY/NEWS/WEBINAR/) | 37 |
| WHITEPAPER (HTTPS://BLOGS.EMBARCADERO.COM/CATEGORY/NEWS/WHITEPAPER/) | 9 |
| WINDOWS (HTTPS://BLOGS.EMBARCADERO.COM/CATEGORY/WINDOWS/) | 25 |

Toggle Reader Mode

 (<https://feeds.feedburner.com/stackoverflow/newest-delphi>) Unknown Feed ()

 (<https://feeds.feedburner.com/stackoverflow/newest-interbase>) Unknown Feed ()

CATEGORIES

- News (<https://blogs.embarcadero.com/category/news/>)
- RAD Studio >
- Delphi (<https://blogs.embarcadero.com/category/delphi/>)
- C++ (<https://blogs.embarcadero.com/category/cpp/>)
- InterBase (<https://blogs.embarcadero.com/category/interbase/>)
- Community (<https://blogs.embarcadero.com/community/>)
- Tech Partner (<https://blogs.embarcadero.com/category/tech-partner/>)



[Showcase](#) >[Community](#) >

FOLLOW US

[f](https://www.facebook.com/embarcaderotech/) (<https://www.facebook.com/embarcaderotech/>) [🐦](https://twitter.com/EmbarcaderoTech) (<https://twitter.com/EmbarcaderoTech>)[🐙](https://github.com/Embarcadero) (<https://github.com/Embarcadero>) [📺](https://www.youtube.com/channel/UCMmsCQhkz-WIJ-IVBzPhbgA) (<https://www.youtube.com/channel/UCMmsCQhkz-WIJ-IVBzPhbgA>)

Embarcadero's users understand the scalability and stability of C++ and Delphi programming, and depend on the decades of innovation those languages bring to development. Ninety of the Fortune 100 and an active community of more than three million users worldwide have relied on Embarcadero's award-winning products over the past 30 years. Icons by Icons8.com (<https://icons8.com/>).

© 2024 EMBARCADERO (<https://www.embarcadero.com/>) INC. ALL RIGHTS RESERVED