



# ORF EXTERNAL DATABASE GUIDE

for Microsoft SQL Server 2012 Express

For ORF users

Revision 1.2

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# INTRODUCTION

## What is this guide about?

This guide provides step-by-step instructions for setting up Microsoft SQL Server 2012 Express to provide database services for ORF.

Please consider that this guide cannot cover the complex topic of administering a database server. We strongly recommend to consult the documentation of the database product on securing and administering the database product of your choice.

## About Microsoft SQL Server 2012 Express

Microsoft SQL Server 2012 Express is a free database server product from Microsoft. It is basically the same product as Microsoft SQL Server 2012, but with some technical restrictions, for instance:

- Database size is limited to 10 GB per database.
- Hardware utilization limits (single physical CPU and max. 1 GB of RAM)

## Shall I be concerned about the SQL express limitations?

Probably not. If your SQL Server Express is dedicated to ORF only, you are unlikely to run into performance issues, unless you run ORF in a very high load environment (800,000 - 1,000,000 emails per day). If you experience low response times from SQL Server Express (SQL timeout errors in the ORF logs), you may want to consider upgrading to the full SQL Server version.

# GETTING STARTED

## Getting Microsoft SQL Server 2012 Express

You can download Microsoft SQL Server 2012 Express free of charge from the following link:

<https://www.microsoft.com/en-us/download/details.aspx?id=56042>

For creating and managing the databases, this guide uses the free tool called SQL Server Management Studio (SSMS) which is available at:

<https://docs.microsoft.com/en-us/sql/ssms/download-sql-server-management-studio-ssms>

# INSTALLATION

Before installing SQL Server Express, make sure you have **.NET Framework 3.5 SP1** enabled on your server and **.NET Framework 4.0** installed, otherwise your SQL Server Express installation will fail.

Once .NET 4.0 is installed, you can proceed with the installation of **Microsoft SQL Server 2012 Express**. Use the default options offered by the installer, except where the guide tells you otherwise.

1. On the **Feature Selection** page, make sure **Management Tools - Basic** is selected.
2. On the **Instance Configuration** page the installer will offer to create a named instance for the databases. The guide assumes the name **SQLExpress** was given.
3. On the **Service Account** page, the installer creates separate accounts for each SQL service.
4. On the **Database Engine Configuration** page, switch the Authentication mode to **Mixed Mode** and submit the password for the **sa** account.
5. Finish the installation of SQL Server 2012 Express.

## CREATING THE DATABASE & TABLES

Once SQL Server Express is installed, we can proceed with creating a database for ORF, which will store the **Auto Sender Whitelist**, **Greylisting**, **Honeypot** and **Directory Harvest Attack (DHA)** and **SQL Log** databases. To ease things, we provide an SQL script shipped with this guide (*sql-orf.sql*), which will create the database (called “*ORF*”) along with a database owner user (called “*orfuser*”) with a default password (“*ChangeThisPwd#1*”).

**NOTE:** if you already have some of the tables created, please run the individual SQL scripts for creating tables for the new features only. Features and scripts:

- Auto Sender Whitelist: *sql-aswl.sql*
- DHA Protection Test: *sql-dha.sql*
- Greylisting: *sql-grey.sql*
- Honeypot Test: *sql-honeypot.sql*
- SQL Log: *sql-log.sql*

If the database is already set up, you can skip the instructions for creating a user, changing the password, etc.

1. Start the **SQL Server Management Studio** tool.
2. Connect to the SQL Server instance.
3. Open the ORF SQL script file (*sql-orf.sql*) in **SQL Server Management Studio** (*File* | *Open* | *File...* in the main menu or *Ctrl+O*)
4. Select the instance in the *Object Explorer* on the left.
5. Right click anywhere in the script and choose **Execute**. You should get a “*Command(s) completed successfully.*” message.

A new database should appear called **ORF** with tables called *dbo.ASWL*, *dbo.DhaBlacklist*, *dbo.DhaHistory*, *dbo.GREY*, *dbo.HoneypotBlacklist* and *dbo.Log*. If they are not listed, try to *Refresh* the view.

## CHANGING THE PASSWORD

1. Right click *orfuser* in *Security \ Logins* and select *Properties*.
2. Change the password.
3. Click **OK**.

## ADDITIONAL SETTINGS

Networking protocols are disabled by default in SQL Server Express, however without these, ORF cannot connect to it. Follow the steps below to enable the required network protocol.

1. Start the **SQL Configuration Manager** from the "Microsoft SQL Server 2012" Program menu (Configuration Tools).
2. Select the "**Protocols for SQLEXPRESS**" node. TCP/IP is disabled by default.
3. Right click on "**TCP/IP**" and click **Enable**.
4. Restart the **SQL Server Service**.

### Configuring the SQL server port

Follow the steps below to configure the SQL Server to listen on a fixed port.

1. Start the **SQL Configuration Manager** from the "Microsoft SQL Server 2012" Program menu (Configuration Tools).
2. Select the "**Protocols for SQLEXPRESS**" node. TCP/IP is disabled by default.
3. Right click on "**TCP/IP**" and select **Properties**.
4. Select the "**IP Addresses**" tab.
5. Delete "**0**" from "**TCP Dynamic Ports**" for the network interface you use to connect to the database (if it is blank, dynamic ports will be disabled).
6. Enter a port number to use in "**TCP Port**" (in this example, we will use **1754**). Also make sure that the network interface you will use to connect is in "**Enabled**" state.
7. Click **Apply** and **OK**.
8. Restart the **SQL Server Service**.

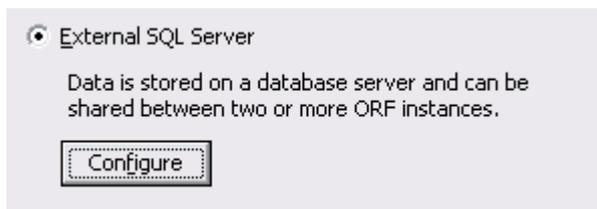
Note that setting a fixed port is not strictly required. You can also use the default dynamic port settings. In that case, the **SQL Server Browser Service** must be running and the port number must not be included in the connection string.

# CONNECTING ORF TO THE DATABASES

ORF connects to the database using a *connection string* that specifies the connection parameters for ORF.

## Connecting the Auto sender whitelist database

1. Start the ORF Administration Tool.
2. In *Whitelists / Auto Sender Whitelist* click the **Database** button.
3. Select the **External SQL Server** radio button.



4. Click the **Configure** button.
5. Enter the connection string as described below:

```
Provider=<PROVIDER>;  
Server=<HOSTNAME or IP ADDRESS>\<INSTANCENAME>,<PORT>;  
Database=<DBNAME>;  
User Id=<USERNAME>;  
Password=<PASSWORD>;  
DataTypeCompatibility=80;
```

According to the instance name and port we used in this example, the connection string looks like this (connecting to the specified instance, fix port):

```
Provider=SQLOLEDB;  
Server=ORFSRV\SQLEXPRESS,1754;  
Database=ORF;  
User Id=orfuser;  
Password=NewPassword;  
DataTypeCompatibility=80;
```

6. Finally, test the connection string by clicking the *Test Connection* button. You should get a message: “*Connection test was successful*”.

## Connecting the Greylisting database

1. Start the **ORF Administration Tool**.
2. Select *Blacklists / Greylisting* and click the **Database** button.
3. Continue as in the case of the Auto Sender Whitelist setup steps 3-6.

## Connecting the DHA database

1. Start the **ORF Administration Tool**.
2. In *Blacklists / DHA Protection Test* click on the **Database** button.
3. Continue as in the case of the Auto Sender Whitelist setup steps 3-6.

## Connecting the Honeypot database

1. Start the **ORF Administration Tool**.
2. In *Blacklists / Honeypot Test* click on the **Database** button.
3. Continue as in the case of the Auto Sender Whitelist setup steps 3-6.

## Connecting the SQL Log database

1. Start the **ORF Administration Tool**.
2. In *System / Log* click on the **SQL Log Configure** button.
3. Select the Connection tab and continue as in the case of the Auto Sender Whitelist setup steps 4-6.

# DIFFERENT GENERATIONS OF OLE DB DRIVERS

The providers SQLOLEDB, SQLNCLI, and SQLNCLI11 are no longer maintained by Microsoft. Although they work with ORF just fine, you should consider upgrading to the new provider MSOLEDBSQL.

You can download the driver for the new provider from this link:

<https://learn.microsoft.com/en-us/sql/connect/oledb/download-oledb-driver-for-sql-server>

While connecting to the SQL database using the new provider follows a similar process as described above, make sure to change the 'Provider' keyword value to 'MSOLEDBSQL19' in the connection strings. Additionally, include the 'Use Encryption for Data' keyword with the corresponding value - either 'Optional,' 'Mandatory,' or 'Strict,' depending on the SQL server configuration, as shown below:

```
Provider=MSOLEDBSQL19;
```

```
[...]
```

```
Use Encryption for Data=Optional;
```

## TROUBLESHOOTING

**PROBLEM:** I cannot connect to the database remotely.

**SOLUTION:**

1. Make sure that the **SQL Service** is running.
2. Make sure that **TCP/IP** is enabled for the network interface you try to connect with.
3. Make sure that your firewall does not block the connection.
4. Try with “**Named pipes**” enabled (in the “**Protocols for SQLExpress**” node).
5. Connect to the database server locally using `sqlcmd` (from command line, e.g. `sqlcmd -s <server>\SQLEXPRESS`) and run the following sequence of commands to allow remote connections:

```
sp_configure 'remote admin connections',1  
go  
reconfigure  
go
```

## TECHNICAL SUPPORT

Please find our technical support contact options on our website at:

<https://vamssoft.com/r?o-support>