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User Guide

DOT Extract

Version 24.0

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Table 1: Contact DOT Software

Preface

Document purpose

This document is intended to guide you through installing and using DOT Extract.

Intended Audience

This document is intended for all DOT Extract users.

Related Documentation

Related Documentation
Release Notes

Table 2: Related Documentation

Publication Record

Unless stated otherwise, all content is valid for the most current version of DOT Extract listed as well as every subsequent version.

Product Version	Document Version	Publication Date	Update Record
≥ 24.0	1.3	February, 2024	No functional changes
23.3	1.2	November, 2023	Documentation updated for product evolution. New features and enhancements: <ul style="list-style-type: none"> Added option to use more than one schema in a data source. This has an impact on creation of data sources and filters, as well as the extraction process Added options to manage multi-schema in the WEB APP and the CLI Added option to refresh statistics before the execution of an extraction project. This option is also available on the CLI Added option to protect a created data source from injection

Table 3: DOT Extract User Guide Publication Record

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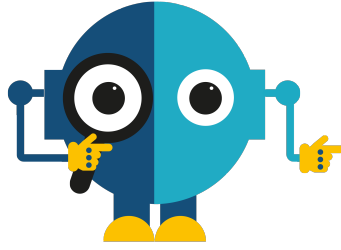
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Introduction

1 About DOT Extract

Sample groups of data in the blink of an eye

With DOT Extract, it is possible to create realistic test data sets that are small enough to support fast test cycles, yet large enough to accurately reflect the variety of production data.

Modern software development requires representative test data that must be easily and quickly made available. Providing a copy of the entire production database to data users would be too costly in terms of time and disk space.

DOT Extract can extract realistic and consistent data for testing, analysis, training, or sharing outside your organization.

Data sets created with DOT Extract have the following advantages:

- having access to data sets that contain all the table relationships needed to run programs very quickly and inexpensively,
- limiting the costs related to storage and administration,
- accelerating the development by providing each team with its own test data in parallel.

DOT Extract can extract data from relational databases, that guarantee the fact that the stored data points that are related to one another.

The list of relational databases covered by DOT Extract is the following:

- MS SQL Server,
- PostgreSQL,
- Oracle,
- MySQL,
- DB2 for i.

2 Functional Description

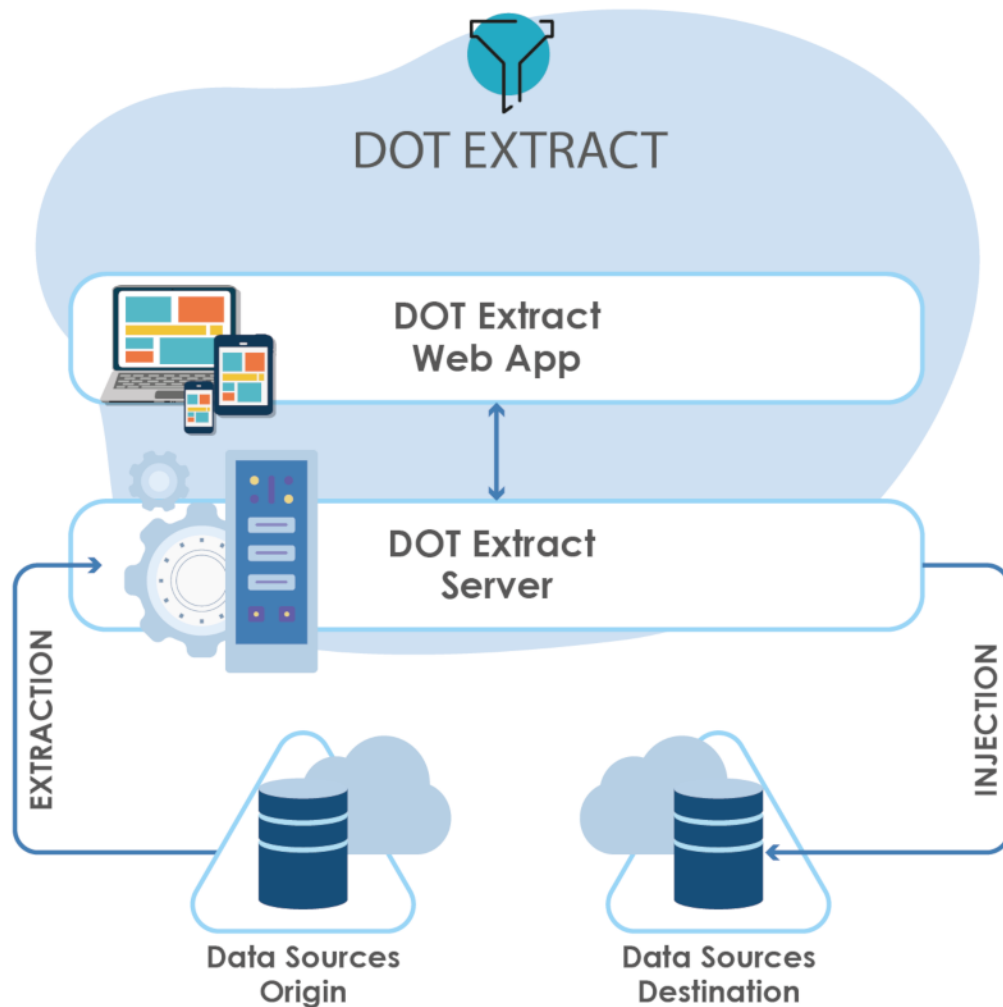


Figure 1: The DOT Extract architecture diagram

DOT Extract is composed by one main element, which is the Extract Server, that needs to be installed. Once it is installed, you can have access to the web interface of DOT Extract.

Reference

For more information about installing the Extract Server, refer to [Installing the Extract Server on page 25](#).

For more information about the connection to the Extract Web App, refer to [Connecting to the Extract Server on page 34](#).

All of the items required to use DOT Extract are managed by the Extract Server and piloted in the Extract Web App.

The data sources are the databases external to DOT Extract from where data is extracted and to where it is injected.

The Extract Server contains the data and executes extractions. It stores all the elements needed and required to set up and execute the projects, and gives access to the entities that are delivered with DOT Extract.

The Extract Web App is a Web-based application that connects to the Extract Server. It allows you to create and manage all the entities required to set up and execute extraction and injection projects, launch those projects and view the results. It also allows you to view and edit the data model of each data source.

3 Main concepts

DOT Extract is intended to proceed to the extraction of consistent and smaller sized databases. The data extracted can come from a production database and can be used for test and training environments. The data extractions are done by respecting relational constraints, key uniqueness and the non-generation of duplicate data. DOT Extract also offers the possibility to filter table rows by selecting values or data ranges.

The goal of this page is to be able to create data sources, filters, data extractions and data injections, with concrete examples to follow through, in order to give you some context during the tour of the features available in the Extract Web App.

With DOT Extract, it is possible to get a complete extraction project by following four major steps:

1. Define the connection to data sources and display data models.

Data sources represent the databases where the data is stored, from where it is extracted and to where it can be injected.

The data sources are defined via a wizard on the Extract Web App and once a data source is created and its status is marked as **Available**, you can immediately view its data model. The data model page gathers all the details and information needed about the tables contained in a specific data source, as well as their primary and foreign keys.

Example

Assuming that an Oracle data source created and defined on DOT Extract contains information about customers and their orders. The data model can then display the description tables contained in the data source, with information such as the **Customer ID**, which is the primary key in a Customers table and foreign key in an Orders table.

For more details about data source creation and data models, we recommend that you read the following documentation: [Data Sources on page 37](#) and [Data Models on page 41](#).

2. Create one or several filters on existing data sources.

Use filters on large data sources to reduce the scope of data to take into account before launching an extraction, as they are very precise extraction requests.

The filters are created via a wizard on the Extract Web App and once they are created, you can view them and you have to edit them to add your customized filter selection.

Example

Assuming we are still using that same Oracle data source we created, which contains information about customers and their orders. With DOT Extract, you can create a specific filter that can, for instance, retrieve only French customers. To do so, you can create a Selection with a **Binary** filter on the **Address** table, put the **Country** column as first operand, use the **=** operator and set the second operand to **France**.

For more details about how to create and manage filters and the available operators, we recommend that you read the following documentation: [Filters on page 47](#).

3. Configure and execute the extraction project.

Once the data source and filters on data source are set, you can create your extraction projects.

The extraction projects are created via a wizard on the Extract Web App and once they are created, you can view them, edit them and eventually launch them.

On DOT Extract, an extraction project is created in three steps:

- main properties definition,
- entry tables selection and
- extraction branches definition.

Once all the parameters have been completed and the extraction project is created, it appears in the list of extractions and it is available for modifications. You can track the status of the extraction process and view all the details of the logs in the Extraction Results view.

For more details about the creation of an extraction project, its execution and results, we recommend that you read the following documentation: [Extractions on page 55](#) and [Extraction results on page 60](#).

4. Configure and execute the injection.

The final part of the main processes available on DOT Extract is the creation and execution of injection projects, based on the selected extracted data and a chosen injection destination.

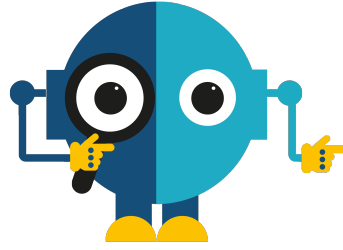
The injection projects are created via a wizard on the Extract Web App and once they are created, you can view them, edit them and eventually launch them.

On DOT Extract, an injection project is created in two steps:

- main properties definition and
- target data source selection.

Once all the parameters have been completed and the injection project is created, it appears in the list of injections and it is available for modifications.

For more details about the creation of an injection project, its execution and results, we recommend that you read the following documentation: [Injections on page 64](#) and [Injection results on page 67](#).



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System requirements

4 System requirements for the Extract Server

Chapter Summary

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4.1 Windows

4.1.1 Hardware requirements

The following table lists the hardware components that are required for the Extract Server on Windows x64.

Requirement	Value
System Architecture	64bits processor
CPU	DUAL Core processor recommended
Physical memory (RAM)	4GB minimum, 16GB recommended ¹
Hard disk	RAID storage or any secured storage with redundancy, backup and monitoring
Disk Space	Typical Install Type total: 10GB (100GB and more recommended for archives)
Network	Any TCP/IP capable network interface

Table 4: Extract Server Hardware Requirements - Windows

4.1.2 Software requirements

The following table lists the software requirements for the Extract Server on Windows x64.

Requirement	Value
Operating system	Any Microsoft supported server OS with Java (e.g. Windows server 2016, any version)
Network protocol	<ul style="list-style-type: none"> TCP/IPv4 TCP/IPv4 with SSL
Filesystem	NTFS or any journalized filesystem

Table 5: Extract Server Software Requirements - Windows

¹Physical memory is used by this entity and all subsequent processes, operating systems and any other software installed on the server. Please refer to additional software vendors for additional physical memory requirements.

4.1.3 Host name resolution

Typically, the computer on which you want to install the Extract Server is connected to a network. Ensure that the computer host name is resolvable through a Domain Name System (DNS) or a centrally-maintained TCP/IP host file, such as `/etc/hosts` (file is located in `C:\Windows\System32\drivers\...`). Use the ping command to ensure that your computer host name is resolvable.

Example

```
hostname sC:\> hostname
SERVERHOSTNAME
C:\> ping SERVERHOSTNAME

Pinging SERVERHOSTNAME.exemple.com [192.168.1.10] with 32
bytes of data:
Reply from 192.168.1.10 : time<1ms
Reply from 192.168.1.10 : time<1ms
Reply from 192.168.1.10 : time<1ms
Reply from 192.168.1.10 : time<1ms

Ping statistics for 192.168.1.10:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

If your computer host name does not resolve, contact your system administrator.

4.1.4 Users, Groups and Environments for the Extract Server

Note

Please refer to your OS and system administrator for common security practices.

In order to install the Extract Server software you will need to log into the system with administrator privileges.

The Extract Server does not need a dedicated group name. If the application is run as a service it will need a user account with the 'log on as a service' right. This account will need ownership and read/write rights on directories and files where the software will be installed.

The special account LocalSystem can be used.

Depending on the configuration of the deployment processes, the user account might need rights on other directories and commands/software involved in the deployment processes.

The environment must be clean of variables which might affect java software such as JAVA_HOME, JDK_HOME, JRE_HOME, JAVA_OPTIONS, JAVA_OPTS, JVM_OPTS, CLASSPATH, etc.

Important!

PATH must contain all java related binaries and tools.

TMP, TEMP, TMPDIR and TEMPDIR can be set to any desired temporary storage location.

4.2 Linux

4.2.1 Hardware requirements

The following table lists the hardware components that are required for the Extract Server on Linux x64.

Requirement	Value
System Architecture	64bits processor
CPU	DUAL Core processor recommended
Physical memory (RAM)	4GB minimum, 16GB recommended ¹
Hard disk	RAID storage or any secured storage with redundancy, backup and monitoring
Disk Space	Typical Install Type total: 10GB (100GB and more recommended for archives)
Network	Any TCP/IP capable network interface

Table 6: Extract Server Hardware Requirements - Linux

4.2.2 Software requirements

The following table lists the software requirements for the Extract Server on Linux x64.

Requirement	Value
Operating system	Linux 64bits
Java JRE	Java runtime 8; 64 bits required
Runlevel	Server should be started in multi-user mode, commonly runlevel 3 or 5
Network protocol	<ul style="list-style-type: none"> TCP/IPv4 TCP/IPv4 with SSL
Filesystem	Ext3, ext4 or any journalized filesystem

Table 7: Extract Server Software Requirements - Linux

4.2.3 Host name resolution

Typically, the computer on which you want to install the Extract Server is connected to a network. Ensure that the computer host name is resolvable through a Domain Name System (DNS) or a centrally-maintained TCP/IP host file, such as /etc/. Use the ping command to ensure that your computer host name is resolvable.

¹Physical memory is used by this entity and all subsequent processes, operating systems and any other software installed on the server. Please refer to additional software vendors for additional physical memory requirements.

Example

```
$ hostname
SERVERHOSTNAME

$ ping -c 1 SERVERHOSTNAME
PING SERVERHOSTNAME.exemple.com (192.168.1.10) 56(84) bytes
of data.
64 bytes from SERVERHOSTNAME.exemple.com (192.168.1.10):
icmp_seq=1 ttl=64 time=0.025 ms

-- SERVERHOSTNAME.exemple.com ping statistics --
1 packets transmitted, 1 received, 0% packet loss, time 0ms
rtt min/avg/max/mdev = 0.025/0.025/0.025/0.000 ms
```

If your computer host name does not resolve, contact your system administrator.

4.2.4 Users, Groups and Environments for the Extract Server

Note

Please refer to your OS and system administrator for common security practices.

If you are installing the software from an X Window System workstation or X terminal, then log in as root and enable remote display.

In order to install the Extract Server software you will need to log into the system with administrator privileges.

DOT Extract does not need a dedicated group name, although a dedicated user account with a dedicated group should be created. This account will need ownership and read/write rights on directories and files where the software will be installed.

The special account *root* should not be used to run the software but is needed to install services.

Depending on the configuration of the deployment processes, the user account might need rights on other directories and commands/software involved in the deployment processes.

The environment must be clean of variables which might affect java software such as JAVA_HOME, JDK_HOME, JRE_HOME, JAVA_OPTIONS, JAVA_OPTS, JVM_OPTS, CLASSPATH, etc.

Important!

PATH must contain all java related binaries and tools.

TMP, TEMP, TMPDIR and TEMPDIR can be set to any desired temporary storage location.

4.3 IBM i

4.3.1 Hardware requirements

The following table lists the hardware components that are required for the Extract Server on IBM i.

Requirement	Value
Physical memory (RAM)	4GB minimum, 16GB recommended ¹
Disk Space	Typical Install Type total: 10GB (100GB and more recommended for archives)
Network	Any TCP/IP capable network interface

Table 8: Extract Server Hardware Requirements - IBM i

4.3.2 Software requirements

The following table lists the software requirements for the Extract Server on IBM i.

Requirement	Value
Operating system	IBM i 7.1 or above
Network protocol	<ul style="list-style-type: none"> • TCP/IPv4 • TCP/IPv4 with SSL
Java JRE	Java runtime 8; 64 bits required
At least one instance of the Remote Execution Server (REXEC) must be running.	

Table 9: Extract Server Software Requirements - IBM i

4.3.3 Host name resolution

Typically, the partition on which you want to install the Extract Server is connected to a network. Ensure that the partition host name is resolvable through a Domain Name System (DNS) or the centrally-maintained TCP/IP host table (go CFGTCP, option 10).

Use the PING command to ensure that your computer host name is resolvable.

```

Example
PING RMTSYS(hostname)
Verifying connection to host system
hostname.domain.com at address 192.168.0.10.
PING reply 1 from 192.168.0.10 took 18 ms. 256 bytes. TTL 64.
  
```

If your computer host name does not resolve, contact your system administrator.

¹Physical memory is used by this entity and all subsequent processes, operating systems and any other software installed on the server. Please refer to additional software vendors for additional physical memory requirements.

4.3.4 Users for the Extract Server

Step 1 Log into the system with a profile with the following special authorities:

- *ALLOBJ
- *SECADM
- *JOBCTL

Step 2 After the installation, a DOT Extract user profile is created and granted these special authorities.

Result The Extract Server runs under this profile by default.

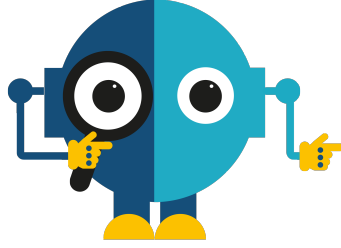
5 System requirements for the Extract Web App

Supported browsers:

- Microsoft Edge
- Google Chrome
- Firefox
- Safari
- Opera

Browser plug-ins are required by the default client; only JavaScript needs to be enabled.

Support on mobile browsers has some limitations.



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Installation

6 Installing the Extract Server

The Extract Server centralizes all the necessary elements to carry out the extraction and injection processes. The server is the core of DOT Extract, as it is required to use the Extract Web App.

Important!

Before installing or updating DOT Extract, first read carefully the Release Notes.

In these release notes, you will find all the information specific to each release of DOT Extract, especially specific warnings you should be aware of before installing or upgrading the product (compatibility breaks, exceptional migration procedures, etc.).

6.1 Windows

The Extract Server runs as a Windows service.

The installation process takes approximately 5 minutes. It is a simple procedure similar to most other Windows applications. For trouble-free installation, it is recommended that you close all active Windows applications before beginning the installation.

Note

If the tool is already installed on your computer, reinstalling it will update it to the new version automatically.

6.1.1 Installing

Follow the subsequent steps to install the Extract Server on Windows.

Step 1 Copy the .exe file to your machine and execute it to launch the wizard. Your profile must have administrator privileges to run the execution file.

Step 2 From the **Select Setup Language** window, select the language for the installation.

Step 3 Review and accept the license agreement.

The **License Agreement** page presents the DOT Software license agreement for you to review. Please read it carefully. When you have reviewed the agreement, select **I accept the agreement**.

Step 4 Confirm the installation location.

The **Select Destination Location** screen displays the default location where DOT Software elements will be installed. If you prefer to install the software elements in a different location, either type in the location, or click **Browse...** to navigate to and select the alternate location.

The default root location is `C:\Program files\DOT Solutions\`.

A sub-folder for each DOT Software application you install will be created at this location.

Warning!

The access rights to this folder can then be restricted to the user used to run the Server's Windows service.

Step 5 Install.

The **Ready to Install** screen enables you to review and change or confirm the setup parameters provided and to launch the installation.

To change a setup parameter, click **< Back** and return to the necessary screen.

If you agree with the installation parameters displayed, click **Install** to start the copy phase of the installation process. The process may take a moment while the windows services are launched.

As the installation proceeds, a status bar displays its progress. Each element copied appears above the status bar. Click **Cancel** to interrupt the installation.

Step 6 Define the TCP ports to use.**Important!**

The ports defined here will be used to configure the connection.

Press **Enter/Next** to use the default ports.

The Extract Server's default HTTP port is 5257, and the default HTTPS port is 52570.

If an application is already using it, the default port number is incremented until a free port number is found. It is possible to manually change the port after installation.

Step 7 Select the Windows user account.

The Extract Server runs as a Windows service. Select the user account that will be used to manage the service.

By default, the local system account is selected. If you do not want to use that account, you can select any user account with enough privileges to run a Windows service, and have a read and write access to the folder where DOT Extract is installed.

Step 8 Complete the setup process. The final page of the wizard displays confirmation that the setup was a success. Click **Finish** to close the setup wizard.**Step 9** Verify the Windows Service is running.

The final screen of the installation process enables you to automatically open the Local Services Management Console. If the **Open Windows service** checkbox is selected, the **Services** window opens after clicking **Finish**. This window enables you to verify that its status is set to "Started".

Result The Extract Server is installed and available for use.

6.1.2 Uninstalling

Follow the subsequent steps to uninstall the Extract Server from Windows.

Step 1 Log into the system with an administrator account.

Step 2 Either launch the *uninstall.exe* located in the installation directory

- or -

Open **Add or Remove Programs** (*Start > Control Panel*), find the module in the list of installed software and select **Uninstall**.

Step 3 Remove any remaining files in the installation path and remove any remaining configuration files in the user directory.

Result The Extract Server is now completely uninstalled.

6.2 Linux


6.2.1 Install

Follow the subsequent steps to install Extract Server on Linux.

Step 1 Transfer the *.tar.gz* to the */tmp* directory on the target system.

Step 2 Open a terminal session and go to the installation directory.

 **Example**
cd /opt

 **Note**
By default, the server is intended to be installed in the */opt* directory. If you install it in a different directory, you will have to update the server's scripts (see [Step 7 Edit the scripts](#)).

Step 3 Execute the following command to extract the *tar.gz* archive into the current directory:

```
tar xzf Extract-Server-[version number].tar.gz
```

Step 4 [*Optional*] If you need to change the listening port(s) for the server, you must do so now.

The Extract Server's default HTTP port is 5257, and the default HTTPS port is 52570.

To change the ports, open the *configuration/com.arcadsoftware.server.restful.cfg* in a text editor and change the following properties:

- **port**=<new HTTP port number> -or- <0> (zero) to disable the HTTP port
- **portssl**=<new HTTPS port number> -or- <0> (zero) to disable the HTTPS port

Step 5 Create a specific user and group to run the server's process with the command:

```
adduser --system --no-create-home --group name
```

Step 6 Change the ownership of the installation directory to give it to the user and group that will run Extract Server:

```
chown username:groupname -R /opt/Extract-Server
```

Step 7 Edit the scripts.

Open the following scripts in a text editor to set the variables to match your execution environment:

- *bin/Extract-Server*
 - Line 8: set to the installation directory if it was not installed in */opt/...* by default.
 - Line 12: set to the new user.
- *bin/Extract-Server.service*
 - Lines 8-14: update the paths so they match the installation directory.
 - Line 16: set the user to the new user.
 - Line 17: set the group to be the new user's or any group of your choice.
- configuration files in the *configuration* folder

Step 8 [*Optional*] Execute the following commands to install Extract Server as a systemd service:


```
cd /etc/systemd/system
systemctl link /opt/Extract-Server/bin/Extract-Server.service
systemctl enable Extract-Server
systemctl start Extract-Server
```

Result Extract Server is installed and available for use.

6.2.2 Uninstall

Follow the subsequent steps to uninstall the Extract Server on Linux.

Step 1 Stop the service using the service manager of your Linux distribution or use the script provided.


 **Example**
Service command:

systemctl stop Extract-Server


Script command:

/opt/Extract-Server/bin/Extract-Server stop

Step 2 Uninstall the service, if any, using the tools from your Linux distribution.

 **Example**
systemctl disable Extract-Server
rm /etc/systemd/system/Extract-Server.service
systemctl daemon-reload
systemctl reset-failed

Step 3 Remove the software from the installation directory.


 **Example**
rm -rf /opt/Extract-Server

Step 4 Remove any remaining files based on the server's configuration.

Result The Extract Server is completely uninstalled.

6.3 IBM i

The Extract Server can be installed and updated manually on IBM i or, depending on your security policy, remotely from any machine running Java.

 **Note**
If the tool is already installed on your computer, reinstalling it will update it to the new version automatically.

6.3.1 Installing

Follow the subsequent steps to install the Extract Server on IBM i.

Step 1 Copy the installation *.jar* file to any directory (such as the */tmp*) on the target IBM i IFS or the machine that will orchestrate the remote installation.

Step 2 Launch the installation setup.

If you are installing manually on IBM i:

1. Open a session on the target IBM i using the QSECOFR profile or an equivalent.
2. Open a command line interpreter using the command QSH. Reach the location where you have copied your installation file.
3. In the command line interpreter, launch the setup using the installation command.

**Example**

```
java -jar Setup_Extract-Server-x.x.x._IBM i.jar
```

If you are installing remotely from Windows or Linux:

1. Launch the setup from the location on the machine orchestrating the installation using the command above. This will open a prompt asking for the **Remote IBM i name/address**.
2. Enter the name/address of the target IBM i.
3. Login using the QSECOFR profile or an equivalent.

Step 3 Define the **AFS Starter Installation library** and iASP which will contain the AFS Starter (a utility program used to start the Extract Server on IBM i).

By default they are **AFSSTARTER** and ***SYSBAS**.

Step 4 Define the installation location.

**Example**

```
/HOME/...
```

Step 5 Define the TCP ports to use.

**Important!**

The ports defined here will be used to configure the connection.

Press **Enter/Next** to use the default ports.

The Extract Server's default HTTP port is 5257, and the default HTTPS port is 52570.

If an application is already using it, the default port number is incremented until a free port number is found. It is possible to manually change the port after installation.

Step 6 Define the **Job user** that will run the Extract Server.

Step 7 Define the job queue library (***LIBL**) then the job queue (**JOBQ**) in which the job will be submitted.

**Example**

```
Job queue library [ARCAD_SYS]
```

```
Job queue [ARCAD_CTL]
```

Step 8 Define the name of the AFS instance to register in the AFSSTARTER.

By default it is **PRODUCT-AFS-ID**.

Result The Extract Server is installed and available for use.

6.3.2 Uninstalling

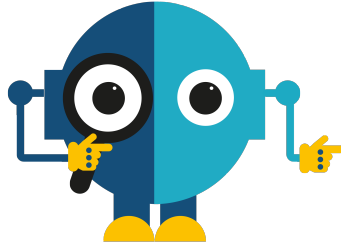
Follow the subsequent steps to uninstall the Extract Server on IBM i.

Step 1 Open a session on the IBM i where the server is installed, using the QSECOFR profile or an equivalent.

Step 2 Stop and delete the service using the following commands:

```
ADDLIB <AFSSTARTER LIBRARY NAME>  
ENDAFSSVR EXTRACT  
DLTAFSSVR EXTRACT DELETE(*YES)
```

Result The Extract Server is completely uninstalled.



D.O.T

Getting Started

7 Overview of the Extract Web App

Once the Extract Server is installed, the Extract Web App is accessible from any web-browser.

The navigator provides access to all of the elements required to manage and execute the extraction and injection processes, to view their results, as well as all the administration tools and the documentation of the product.

Click the  Help button to open the online help of the functional current view.

8 Connecting to the Extract Server

Once the Extract Server is installed, the Extract Web App is accessible from any web-browser.

To access the Extract Web App, enter the following address in your browser:

`<web_server_IP_address>:<web_server_port>/dote`

The connection dialog opens in the web-browser.

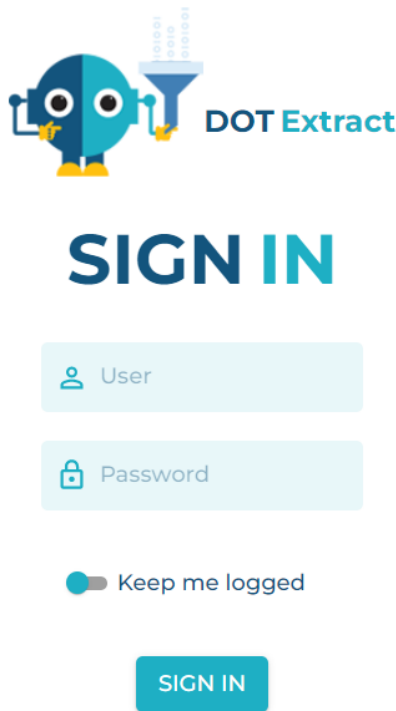


Figure 2: Extract Server connection

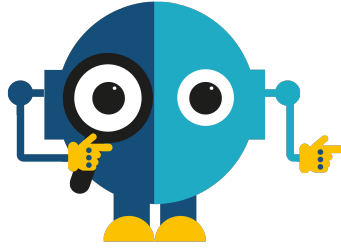
Enter your **User Name** and **Password** and click the **Sign In** button to connect to the Extract Server.

The admin-level user/password is: **admin/quadra**.

Note

After the first connection, the Extract Server prompts you to set a new password for the connection.

To set a new password, click the  User icon then click the **Change Password** button.



D.O.T

Data Sources

Introduction to setting up the data sources

Data sources allow the management of the databases as well as their data structure in the Extract Server. Connections to the origin and destination databases are configured in the data sources. For each data source, DOT Extract generates its data model, that can be visualized in the Data Sources view.

DOT Extract makes it easy to configure the connection to data sources. These entities must be configured before defining extraction and injection processes.

[Data Sources](#) and [Data Models](#) are defined, configured, managed and accessed in the Extract Web App.

9 Data Sources

Chapter Summary

- 9.1 Prerequisites..... 37
- 9.2 Manage data source connections..... 38

The data sources are the databases that contain the data:

- The *origin* data source is the database where the data to subset is extracted from.
- The *destination* data source is the database where the data subset is injected to.

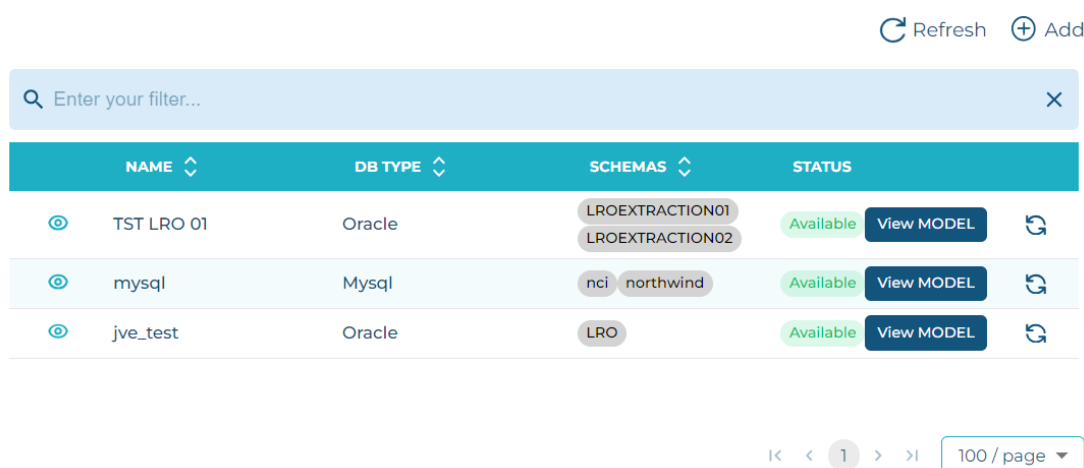


Figure 3: Data Sources

The data sources are accessed and managed in the **Data Sources** view.

9.1 Prerequisites

The users that perform the extraction must have the following user privileges on the extracted tables if they are not the owner of the objects.

Database	User privileges
MySQL	USAGE and SELECT
MS SQL Server	READ or SELECT
Oracle	SELECT object
DB2 for i	READ or SELECT
PostgreSQL	READ or SELECT

Table 10: User privileges required per databases


9.2 Manage data source connections

9.2.1 Create a data source connection

Follow the subsequent steps to create a new data source connection.

Step 1 Open the **Data Sources** view from the **Data Sources** tab, then click the  **Add** button.

Step 2 In the **Add a new Data Source** wizard, define the required properties of the new data source.

 **Important!**
All fields are mandatory.

Name

Enter a unique **Name** for the new data source. This name must be unique.

Database Type

Select a **Database Type** in the drop-down list.

DOT Extract supports the following databases:

- MySQL,
- MS SQL Server,
- Oracle,
- DB2 for i,
- PostgreSQL.

URL / Login / Password


Enter the **URL** of the database, as well as the **Login** and **Password** to have access to it.

Schemas

Define the database **Schemas** to use. The database schema represents the structure of the database. You can add several schemas for one data source. To do so, separate each schema with a semi-colon (;).

Archive

Specify if this data source must be used as archive to store extractions results, rather than using the default H2 file. This option is available for all the data source types, tick the checkbox to use the data source as archiving data source.

 **Important!**
If a data source is used as archive, there is no extraction possible on this data source.

[For DB2 for i] data sources with ARCAD, define the following specific properties.

Important!
 For a DB2 for i data source, the following fields are optional.
 However, for the **ARCAD instance library** and **Application** fields,
 if one is filled, the other one must be completed too.

ARCAD instance library

Enter the name of the library used by your ARCAD instance.

Application

Enter the name of your ARCAD Application.


Version

Enter the ARCAD version of your application.

Step 3 Click **ADD** to create the set data source, or **CANCEL** to stop the process and close the wizard.

Result The new data source connection is created.

When the data source connection is created, DOT Extract accesses the database and creates the corresponding data model. The data source creation status is **In Progress**.

Once the data model is created, the status of the data source is **Available**. Click the  **Refresh** button in case your data source is not displayed yet in the list, or to check its status at all times.

If DOT Extract cannot access the database or create a data model, the status is **Failed**. When this is the case, you can click the **View log** button to display the data source description and the details of the log, providing information about why the connection failed.

9.2.2 Edit a data source connection

To edit a data source connection, click the  **View** button to display the details of the data source, then click the  **Edit** button.

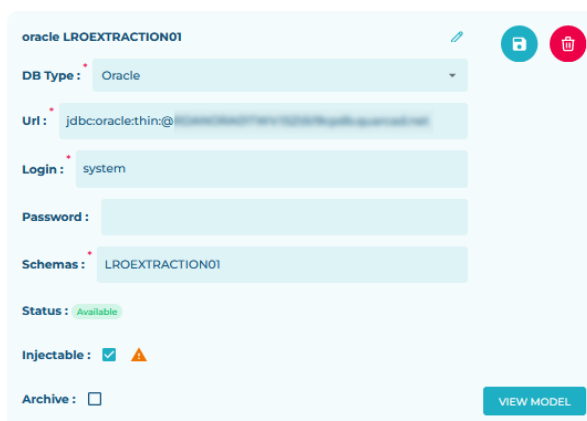



Figure 4: Data source edition

The **Edit** page opens and enables you to edit the **Data source Type**, the **URL**, the **Login** or the **Schemas** fields.



If the data source is one that can be injected into later on, tick the **Injectable** checkbox. If production data sources are used, and you need them protected from eventual injections, keep this option disabled. Click the  Save button to save the changes.

Every time you edit the data source connection, the data model is calculated again by DOT Extract.

 **Reference**

For more information about data models, refer to [Data Models on page 41](#).

9.2.3 Delete a data source connection

To delete a data source connection, click the  View button to view the details of the data source, then click the  Delete button.

A confirmation dialog opens, click **Delete** to confirm, or **Cancel** to keep the data source.

 **Warning!**

Deleting a data source connection also deletes its data model. Once deleted, the data source and its data model cannot be accessed or recovered.

10 Data Models

The data model is a modelization of the structure of the data in a data source. It contains all the elements necessary to be able to structure the data.

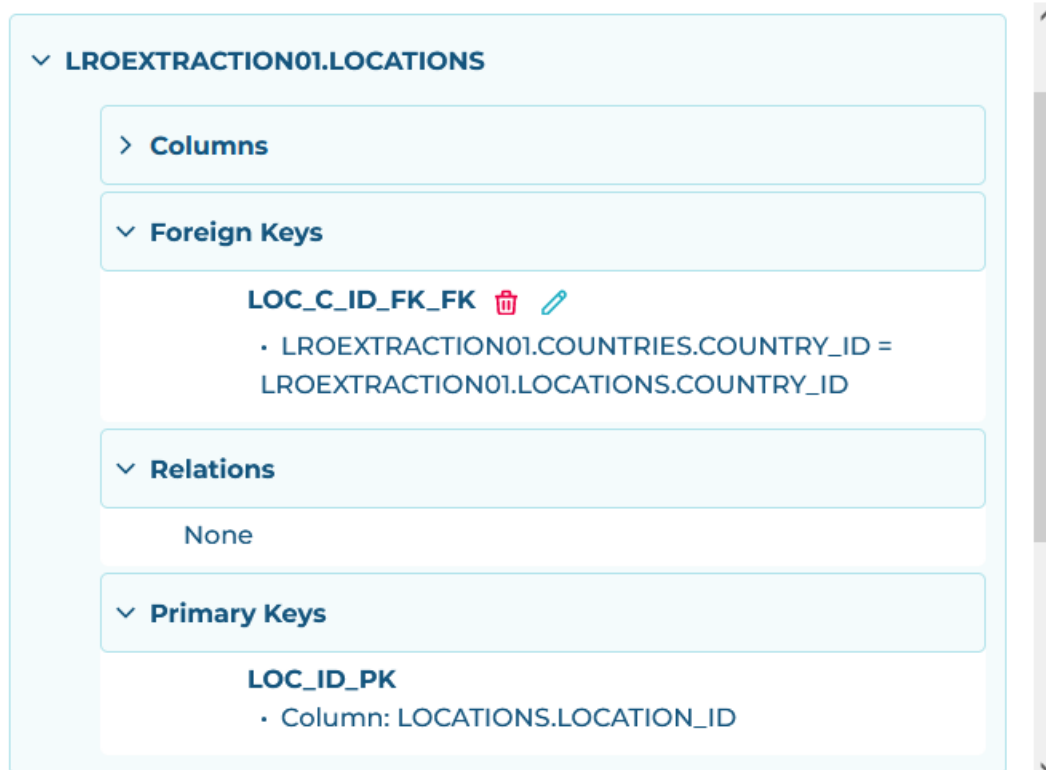
Database models in DOT Extract contain the following elements:

- tables, as well as the different columns that populate each table, and their corresponding data,
- relations
- foreign keys, and
- primary keys.

The data model is generated when the data source connection is established. DOT Extract detects the data structure in the data source and creates a model of its structure. The model is stored in the Extract Server in XML format.

When the connection to the data source is modified, the data model is recalculated automatically and updated. If the data structure in the data source is modified, you need to launch the update of the data model manually. Click the **Update** button to launch the generation of the data model update.

Last Statistics Generation Date: 2023/10/16 14:13:08 [Refresh Statistics](#)



The screenshot displays a data model for 'LROEXTRACTION01.LOCATIONS'. It is organized into several sections:


- Columns:** A section with a right-pointing chevron, currently collapsed.
- Foreign Keys:** A section with a downward-pointing chevron, containing one entry: 'LOC_C_ID_FK_FK' with delete and edit icons. Below it, the relationship is defined as 'LROEXTRACTION01.COUNTRIES.COUNTRY_ID = LROEXTRACTION01.LOCATIONS.COUNTRY_ID'.
- Relations:** A section with a downward-pointing chevron, containing the text 'None'.
- Primary Keys:** A section with a downward-pointing chevron, containing one entry: 'LOC_ID_PK' with the detail 'Column: LOCATIONS.LOCATION_ID'.

Figure 5: Data models

Data models are accessed and managed in the **Data Sources** view. Click the **View Model** button to access each data source model.

10.1 About data model status

When the data source connection is created, DOT Extract accesses the database and creates the corresponding data model. The data source creation status is **In Progress**.

Once the data model is created, the status of the data source is **Available**. Click the  **Refresh** button in case your data source is not displayed yet in the list, or to check its status at all times.

If DOT Extract cannot access the database or create a data model, the status is **Failed**. When this is the case, you can click the **View log** button to display the data source description and the details of the log, providing information about why the connection failed.

10.2 About foreign keys

If required, you can manually modify the foreign keys in a data model. To do so, click the  **View** button to view the details of the data model, then click the  **Edit** button appearing next to the foreign keys.

Click the **Update** button to save the changes.

To remove foreign key links, click the  **Delete** button.

10.3 About complex relationships

DOT Extract enables you to add or remove data relationships in the data model of a data source. These modifications on the data model concern only the relationship between tables and do not impact the foreign keys, as they cannot be modified by users. As the extraction relies on the data model relations, the customization of these relationships influences the extraction process and gives you the possibility to control how tables are extracted and how they are linked.

If a table has a relation with another, in a different schema, the data model must be a multi-data model that contains the two schemas.

DOT Extract offers two methods for the addition of a relation:

- **Simple**: this method is based on column values,
- **Complex**: this method applies an SQL function, that you have to set, on column values.

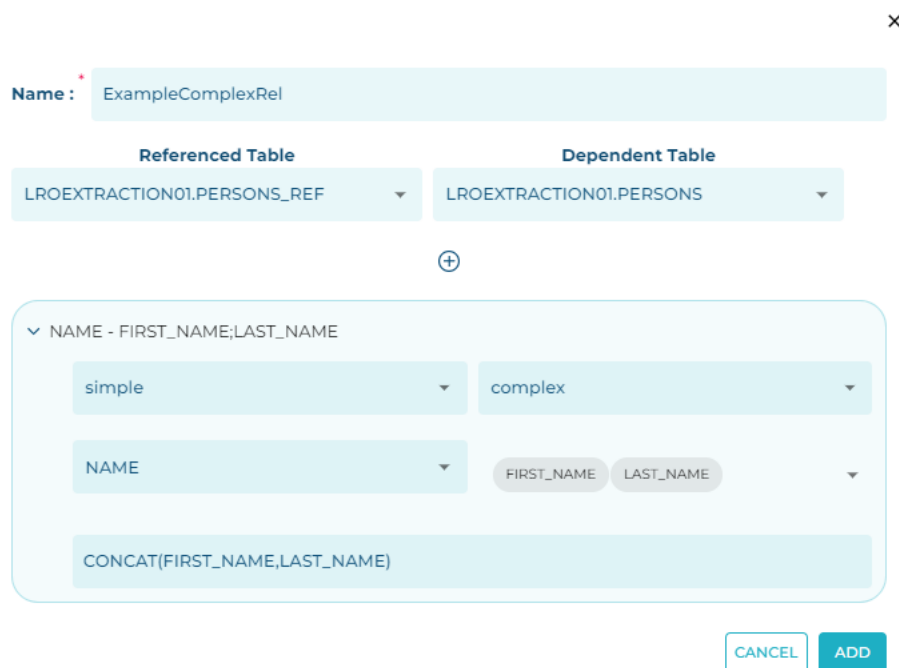


Figure 6: Example of a complex relation on DOT Extract

Follow the subsequent steps to add a relation in the model of a data source.

Step 1 Open the **Data Model** view from the **Data Sources** tab, by clicking on the **View Model** button of a data source.

Step 2 Click the **+** **Add** button to open the relation creation wizard and define the required properties of the new relation.

Name

Enter a **Name** for the new relation. This name must be unique.

Referenced table / Dependent table

Select a referenced and a dependent table from the drop-down list. The tables displayed in the list are the ones available in the data source.

Step 3 Once both referenced and dependent tables are selected, unfold the new selection area displayed in the wizard. For each referenced and dependent table, select **Simple** or **Complex**, to set the type of relationship for each table.

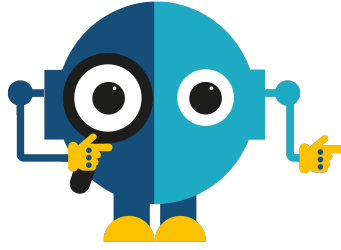
Note

Data relationships via DOT Extract can be set between two simple or two complex tables, as well as between a simple and complex table. Fields are dynamic and are automatically adapted to your choices.

Step 4 Select a column for each table. You can select one or several columns for complex relations.

Step 5 In the **Function** field, enter an SQL function to set the relation between the columns.

Result The data relation is created and taken into account in the extraction process.



D.O.T

Extraction

Introduction to the extraction process

The extraction process ([Extractions](#)) fetches a consistent data set from a data source and stores this data in the Extract Server, for the purpose of injecting it into a testing database later on. The extraction process is based on the data model and the [Filters](#) to extract the data. The [Extraction results](#) are generated when the extraction is launched and completed. The extraction results consist of the data archive and instance logs.

The extraction engine allows the definition of queries that include:

- one mode of extraction that retrieves references only, or
- one of the two modes of extraction that retrieve both references and dependencies.

The factorization of extractions with DOT Extract has the advantage of not generating any duplicates, which would go against data uniqueness and the referential integrity constraint.

Once the extracted data is stored in the archive, no further actions are required to proceed with the injection process. The injection process takes all of the data from the archive and puts it into the target environment.

11 Filters

Chapter Summary

- 11.1 Manage filters.....47
- 11.2 Define a filter with selection clauses.....49
- 11.3 Define an SQL join filter.....50
- 11.4 Variables for filters.....51
- 11.5 List of operators corresponding to operands.....51

Filters enable to extract data from a table with data value criteria on columns.

DOT Extract has several solutions to filter the data:

- Create your own selection filter on based on the combination of binary clause, unary and logical clauses,
- Selection can be expressed in the form of a where clause.
- Create a SQL join filter.

Refresh Add

Enter your filter... X				
NAME	DATA SOURCE	TABLE	SELECTION	
⊕	LRO countries	TST- LRO - ORACLE LRO2	COUNTRIES	REGION_ID == 1
⊕	LRO countries	TST- LRO - ORACLE LRO2	ADDRESS	IDADDRESS == 1
⊕	LRO countries	TST- LRO - ORACLE LRO2	EMPLOYEES	AND (DEPARTMENT_ID == 50)((MANAGER_ID == 121) OR (MANAGER_ID == 122) OR (MANAGER_ID == 123) OR (MANAGER_ID Is null))(EMPLOYEE_ID == 122)
⊕	LRO countries	TST- LRO - ORACLE LRO2	ADDRESS	
⊕	LRO countries	TST- LRO - ORACLE LRO	SCHOOL	ADDRESS_ID Is null

Figure 7: Filters view

Filters are accessed and managed in the **Filters** view.


11.1 Manage filters

11.1.1 Create a filter

Follow the subsequent steps to create a new filter.

Step 1 Open the **Filters** view from the **Filters** tab, then click the **Add** button.

Step 2 The **Add a new Filter** wizard opens. Fill the fields to define the required properties for the creation of a new filter.

 **Important!**
All fields are mandatory.

Name

Enter a unique **Name** for the new filter. This name can be modified later.

Data Source


Select a **Data Source** in the drop-down list, from one of the data sources previously created.

Table

Select a **Table** in the drop-down list. The list only shows the tables in the chosen data source, and the schema relative to each table.



Step 3 Click **ADD** to create the set filter, or **CANCEL** to stop the process and close the wizard.


Result The new filter is created and appears in the list of filters. The next step for the filters to be completely set and work properly, is to define the scope of the filter.

To copy an existing filter, click the  Duplicate icon. Edit the name of the filter to copy to avoid having duplicates in the list, then click **Done**. Any joins, WHERE clauses, selection criteria or parameters created for your filter is also duplicated.

11.1.2 Edit a filter

All existing fields set during the creation of the filter are editable, including the name, data source and table. The edit screen is also used to define the scope of the filter, whether to [Define a filter with selection clauses](#) or to [Define an SQL join filter](#).

Click the  View icon to open the filter to edit, then click the  Edit icon. The editor screen lets you edit any of the fields defined in the wizard and create the query formula to filter your data.

 **Warning!**
Editing the **Data Source** and **Tables** fields to replace the existing ones with another removes the previously created selection and joins queries defined for a specific filter. If you change your data source or table after defining the query, you will lose all the configuration you have made so far.

11.1.3 Delete a filter

To delete a filter, click the  View icon to open the **Edit** page of the filter, then click the  Delete icon.

A confirmation dialog opens, click **Delete** to confirm, or **Cancel** to keep the filter.

 **Warning!**
Deleted filters cannot be accessed or recovered.

11.2 Define a filter with selection clauses

Define the query formula to filter your data using the selectors form the edit screen. These selectors are related to the data source and table selected when creating the filter.

Warning!

Editing the **Data Source** and **Tables** fields to replace the existing ones with another removes the previously created selection and joins queries defined for a specific filter. If you change your data source or table after defining the query, you will lose all the configuration you have made so far.

Follow the subsequent steps to define a filter with selection clauses.

Step 1 Click the  View icon to open the filter you need to edit, then click the  Edit icon.

Step 2 Click the  Selection icon, then select a filter. The available clauses are the following:

Logical

The logical clause is used to define multiple filters joined by **AND** or **OR** conditions.

Note

Logical Clause filters must be immediately followed by a set **Binary** or **Unary** clause.

Binary

The binary clause is used when an operator is applied between a column and value operand.


Unary

The unary clause is used when a function operator is applied to a column or between a column and a value operand.

Note

Some operators work with only one operand, it is the case for the **is Null**, **Max** and **Min** operators.

Important!




Make sure that you click the  Save icon every time you add a new filter in the Selection, as it is not possible to save all filters at once nor create a new filter without saving the one in the process of creation first.

Step 3 Once you have added all the required entries for your filter, click the Save filter button.

Result The new filter is edited and the modifications appear in the filter details page.

Reference

For more information about the available operators for each filter, refer to the [List of operators corresponding to operands on page 51](#).

You can convert a Selection made on a filter into a WHERE clause. To do so, click the  View button corresponding to the filter, then click the  Edit button to modify the filter parameters. Click the  Selection menu then the **Turn to WHERE** option.

 **Important!**

If you turn the Selection into a WHERE clause, it is no longer possible to use the parameters fields.

However you can insert parameters directly in the WHERE clause using the following syntax: `a.[Column_Name1] = ${Parameter_Name1} AND a.[Column_Name2]= '${Parameter_Name2}'`.

 **Note**

The list of available columns is automatically updated when a filter table is modified and saved.

11.3 Define an SQL join filter

JOIN filters enable you to extract data values from one table that are present in another table. The columns of values to match are set by the chosen link or relation between the tables.

A JOIN filter can be associated with a filter which can be a predefined filter or user filter. The optional filter must be defined with tables involved in the JOIN filter.

Define the query formula to filter your data using the join selectors from the edit screen. These selectors are related to the data source and table selected when creating the filter.

 **Warning!**

Editing the **Data Source** and **Tables** fields to replace the existing ones with another removes the previously created selection and joins queries defined for a specific filter. If you change your data source or table after defining the query, you will lose all the configuration you have made so far.

Follow the subsequent steps to define a filter with join clauses.


Step 1 Click the  View icon to open the filter you need to edit, then click the  Edit icon.

Step 2 Click the **Join** button to switch to the join query form.

Step 3 Select a referenced table to create the link and save.

If required, you can associate a selection clause filter directly to the Join query, from the Filter dropdown list.

 **Important!**

Make sure that you click the  Save icon every time you add a new table, as it is not possible to save all filters at once nor create a new filter without saving the one in the process of creation first.

Step 4 Once you have added all the required entries for your filter, click the Save filter button.

Result The new filter is edited and the modifications appear in the filter details page.

11.4 Variables for filters

The use of variables in filters allows you to define a particular value for the filter when executing an extraction project. Add variable tags to the selection when you create the filter and you will be prompted to define the value of the variable when the extraction is executed.

Variable tags can be added to the **Value** field of a binary selection criteria and the **Parameter** field of an unary selection criteria. For more information on how to define filter with unary and binary clauses, refer to [Define a filter with selection clauses](#).

Add a variable tag using the following syntax: `${PARAMETER_NAME}`.

After saving the filter, the tags are used to create the execution parameters of the extraction. When the execution of an extraction project is launched, the execution parameters of all the involved filters are retrieved in the process, and an intermediate page is displayed to allow you to define the value of each execution parameter.



Reference

Refer to [Extractions on page 55](#).

11.5 List of operators corresponding to operands




Note

All the filter clauses operators are available in their **Negative** form




Important!





For date values in filters, click the  Calendar button to select a date in the displayed calendar. You can also use variables for date filters.

If you wish to set the date manually, the accepted formats are the following:

- **Date:** YYYY-MM-DD,
- **Time:** hh:mm:ss,
- **DateTime:** YYYY-MM-DDThh:mm:ss.ssssss, where the millisecond precision can be up to 6 digits and a **T** separator is required between the date and the timestamp.

The details of each operator are the following:

Operator	Description	Value type
Binary		
==	Retrieves values that are strictly equal. The value set in the second operand is case sensitive. <div data-bbox="397 1675 1003 1801" style="border: 1px dashed gray; padding: 5px;"> <p> Example Using the == operator on a NAME column, with the a second operand set to 'Amanda', retrieves the list of employees whose name is Amanda in</p> </div>	String.

Operator	Description	Value type
	 an Employee table.	
>	<p>Retrieves values that are greater than the one set in the second operand.</p> <div style="border: 1px dashed gray; padding: 5px;"> <p> Example Using the > operator on a SALARY column, with the a second operand set to 10.000, retrieves the list of employees that have a salary that is greater than 10.000 in an Employee table.</p> </div>	Date, string or integer.
>=	<p>Retrieves values that are greater than or equal to the one set in the second operand.</p> <div style="border: 1px dashed gray; padding: 5px;"> <p> Example Using the >= operator on a SALARY column, with the a second operand set to 10.000, retrieves the list of employees that have a salary that is greater than or equal to 10.000 in an Employee table.</p> </div>	Date, string or integer.
Contains	<p>Retrieves values that contain the characters set in the second operand.</p> <div style="border: 1px dashed gray; padding: 5px;"> <p> Example Using the Contains operator on a NAME column, with a second operand set to W, retrieves the list of names containing W in an Employee table.</p> </div>	String.
Starts with	<p>Retrieves values that start with the characters set in the second operand.</p> <div style="border: 1px dashed gray; padding: 5px;"> <p> Example Using the Starts with operator on a NAME column, with the a second operand set to E, retrieves the list of names starting with E in an Employee table.</p> </div>	String.
Ends with	<p>Retrieves values that end with the characters set in the second operand.</p> <div style="border: 1px dashed gray; padding: 5px;"> <p> Example Using the Ends with operator on a NAME column, with the a second operand set to N, retrieves the list of names ending with N in an Employee table.</p> </div>	String.
=	<p>Retrieves values that are equal. The value set in the second operand is not case sensitive.</p>	Date, string or integer.
In	<p>Retrieves multiple values corresponding to the ones set in the second operand. Use this filter with a double quoted element.</p> <div style="border: 1px dashed gray; padding: 5px;"> <p> Example Using the IN operator on an ORDER DATE column, with the second operand set to "2005-06-17", "2005-06-18", retrieves the list of orders made on 2005 17h and 18h June in an Orders table.</p> </div>	Date, string or integer.

Operator	Description	Value type
Unary		
is Null	Retrieves results with empty values. This operator has only one operand. <div style="border: 1px dashed gray; padding: 5px; margin-top: 10px;"> Example Using the is Null operator on an EMAIL column retrieves the employees that do not have an email address in an Employee table. </div>	
Max	Retrieves the column that has the maximum value. This operator has only one operand. <div style="border: 1px dashed gray; padding: 5px; margin-top: 10px;"> Example Using the Max operator on a SALARY column retrieves a list of the employees that have the highest salary in an Employee table. </div>	
Min	Retrieves the column that has the minimum value. This operator has only one operand. <div style="border: 1px dashed gray; padding: 5px; margin-top: 10px;"> Example Using the Min operator on a SALARY column retrieves a list of employees that have the lowest salary in an Employee table. </div>	
First Asc	Retrieves a specified number of results in the first ascendant results. The amount of results wanted is set in the second operand. <div style="border: 1px dashed gray; padding: 5px; margin-top: 10px;"> Example Using the First Asc operator on a ZIP_CODE column, with a second operand set to 10, retrieves the first 10 zip codes contained in an Address table, in ascending order. </div>	Date, string or integer.
Last Asc	Retrieves a specified number of results in the last ascendant results. The amount of results wanted is set in the second operand. <div style="border: 1px dashed gray; padding: 5px; margin-top: 10px;"> Example Using the Last Asc operator on a COUNTRY column, with a second operand set to 10, retrieves the last 10 countries contained in an Address table, in ascending order. </div>	Date, string or integer.
Longer	Retrieves results that contain more characters than the number set in the second operand. <div style="border: 1px dashed gray; padding: 5px; margin-top: 10px;"> Example Using the Longer operator on a CITY column, with a second operand set to 10, retrieves the city names that contain more than 10 characters in an Address table. </div>	String.
First Desc	Retrieves a specified number of results in the first descendant results. The amount of results wanted is set in the second operand. <div style="border: 1px dashed gray; padding: 5px; margin-top: 10px;"> Example Using the First Desc operator on a ZIP_CODE column, with a second operand set to 10, retrieves the first 10 zip codes contained in an Address table, in descending order. </div>	Date, string or integer.
Last Desc	Retrieves a specified number of results in the last descendant results. The amount of	Date, string or integer.


Operator	Description	Value type
	<p>results wanted is set in the second operand.</p> <div data-bbox="399 289 1008 453" style="border: 1px dashed gray; padding: 10px;"><p> Example Using the Last Desc operator on a ZIP_CODE column, with a second operand set to 10, retrieves the last 10 zip codes contained in an Address table, in descending order.</p></div>	

Table 11: Operators available according to filter clauses

12 Extractions

Chapter Summary

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The extraction process consists in getting a set of consistent data from a source into an archive (H2 or database schema), while guaranteeing the referential integrity of the database. All of the extractions defined in a request are stored in the same archive and are based on the same data model. The definition of the referenced data to retrieve is defined in the extraction package.

The extraction, based on the source data model, retrieves all of the dependent data so as to get a consistent set of data in the archive. Filters are applied during the extraction to restrict the rows selected, avoiding retrieving all rows from the tables.

The results of the extraction are kept for each extraction instance, unless the instance is deleted. The extraction results can also be injected as many times as necessary, as long as the target database is compatible, meaning that it contains the same table names and structures as the extraction tables stored in the archive.

For each extraction process, the extraction request contains the extraction branches, each of it containing extractions. The extraction request is made of one or multiple extraction definition. The initial extraction is the first request made to the database to get initial data from one table. Each referenced or dependent data linked to this first set of data fetched at level 0 constitute the next level, and eventually, each fetched data has a new level. As a level of extraction is represented by a table, filters can be applied on levels.

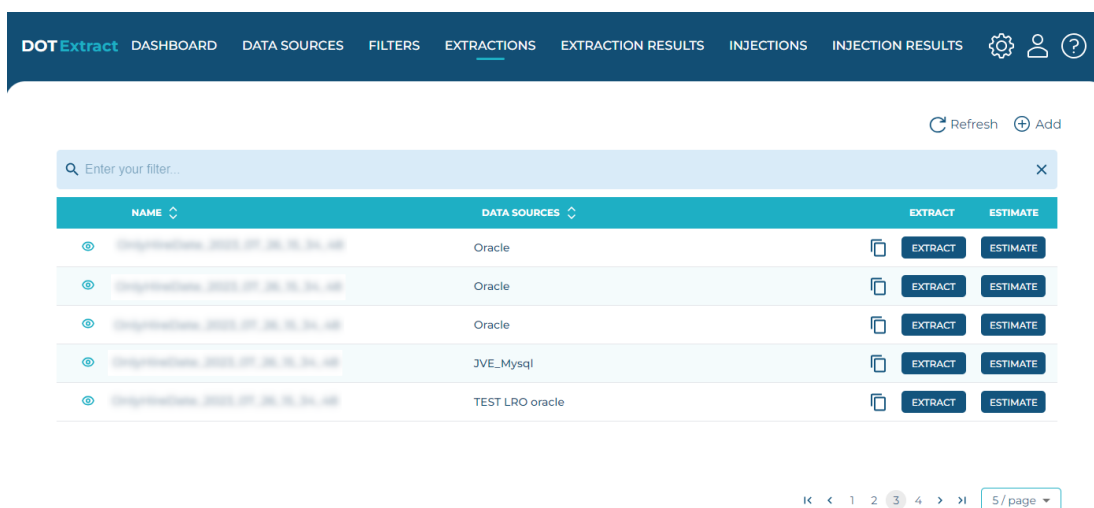


Figure 8: Extractions view

Extractions are accessed and managed in the **Extractions** view.

12.1 Extraction modes

The extraction process gets a set of consistent data from a source and stores that data in an archive. The definition of the data to retrieve is defined in the extraction package. The extraction, with the help of the

provided source data model, is in charge of retrieving all of the direct and intermediate linked table data of the initial table. A filter can be defined in the extraction package so as to define the rows to extract, avoiding retrieving all rows from the initial extracted table.

Data linked to extracted data can be referenced or dependent. To comply with these two options and validate the data model with respect of referential integrity constraints, DOT Extract offers three extraction modes: **referenced**, **all** and **all limited**.

 **Note**

Once the extraction mode is selected for an extraction request, it stays the same for all of the following extraction processes.

Referenced Data

With this mode of extraction, the parent data is extracted in accordance with the declared SQL referential integrity constraints. This type of extraction extracts the data linked to the filter and the data that is referenced by it.

In this mode, only referenced tables are extracted.

All Limited

With this mode of extraction, dependent and referential tables are taken from the initial table to extract.

Referenced tables can only extract referenced table, whereas dependent tables can extract both referenced and dependent tables. This type of extraction allows to exclude data dependencies during the extraction.

All

With this mode of extraction, the parent and the child data is extracted in accordance with the declared SQL referential integrity constraints. This type of extraction allows to extract the data linked to the filter, the data that are referenced by it as well as the data that are dependent on it.

In this mode, referenced and dependent tables are extracted.

 **Important!**

Use this extraction mode with caution, as the extraction process tends to fetch the entire data included in the database.

12.2 Manage extractions

12.2.1 Create an extraction

Follow the subsequent steps to create a new extraction.

Step 1 Click on the **Extractions** tab to open the **Extraction** view, then click the  **Add** button.

Step 2 Define the main properties required for the new extraction.

 **Important!**


All fields are mandatory.

Name

Enter a unique **Name** for the new extraction.

Extraction Type

Select the extraction mode to be used, among the ones available in the drop-down list.


 **Reference**
For more information about extraction modes, refer to [Extraction modes on page 55](#).

Archive password

Define a password to access the H2 database where the extraction is stored.

Data Source

Select a data source for the extraction in the drop-down list.

 **Reference**
For more information about data sources, refer to [Manage data source connections on page 38](#).

Description


Add a textual description of the extraction project.

Archiving Data Source


Set the data source to use as archive to store the extraction results. The drop-down list is populated with the previously created data sources that have been set as archive.

Click **Next**.

- Step 3** Define the entry tables required for the new extraction. Tick the checkbox corresponding to the table(s) that need to be included in the extraction.

 **Note**
The list of tables available also displays the schema it comes from, if the extraction project is made on a data source that has several schemas.

Click **Next**.

- Step 4** Define the extraction branches required for the new extraction. Click the  **Add** button to add a new line.

Table

Select a **Table** in the drop-down list. The list of tables is related to the chosen data source.


Filter

Select a **Filter** in the drop-down list. The list of filters is related to the chosen table in the data source. Selecting a filter is not mandatory. It is possible to extract a table in an extraction project without adding a filter.



Step 5 Click **DONE** to confirm and close the extraction creation pages.

Result The new extraction is created and appears in the list of extractions.


Note

It is also possible to create an extraction project, by duplicating an existing one and make changes. To do so, click the  Duplicate button. Edit the name of the extraction to copy to avoid having duplicates in the list, then click **Done**.

12.2.2 Manage extractions



To edit an extraction, click the  View icon to view the details of the extraction project, then click the  Edit icon. The **Edit** page opens and enables you to edit the **Name**, the **Extraction Type**, the **Data source** and the **Archive passwords** fields.

If you want to refresh statistics before an extraction execution, to obtain consistent data in the extraction results, check the **Refresh statistics** option.

You can also add one or several tables from different schemas to the extraction project, by clicking the  **New Branch** icon. Select the schema(s) and table(s) in the **Table Selection** window, then click the **Add** button. Once the new table is added, the table displays its corresponding schema.

Click the  Edit icon on a table to add a filter. Click the  Exclude icon to exclude dependencies to be extracted from the master table with this filter.

For each table, you can display the list of dependent tables of the current table, by clicking the  **+D** icon, or display the list of referenced tables by clicking the  **+R** icon.

It is also possible to enable the child Extraction mode with the  Enable icon, or disable the child extraction mode with the  Disable icon.

Note

Make sure you click the  Save icon to save the changes.

12.2.3 Execute an extraction

To execute an extraction, click the **Extract** button. A dialog opens to confirm that the extraction is launched. You can track the status and the results of the extraction in the **Extraction Results** view.



If you created an extraction project with variable filter values, an **Execution Parameters** dialog opens when you click **Extract**, so you can define the value of these filter parameters. Once the parameters are set for the extraction, click **Done** to launch the extraction.

Use the **Estimate** option before you execute an extraction, to get a realistic estimation of its final extraction results. This estimation process works the same way as the actual extraction: it is based on the data source content and filters, you can refresh the statistics before the estimation, or add a value if you estimate an extraction with parameters. This estimation is made to be as accurate as possible and displays the expected extraction result, with the only exception that the extraction results are not saved in a H2 file or a data source set as archive.

 **Reference**

For more information about extraction results, refer to [Extraction results on page 60](#).

12.2.4 Delete an extraction

To delete an extraction, click the  View icon to open the **Edit** page of the extraction, then click the  Delete icon.

A confirmation dialog opens, click **Delete** to confirm, or **Cancel** to keep the extraction.

 **Warning!**

Deleted extractions cannot be accessed or recovered.

13 Extraction results

The results of an extraction instance are accessed and managed in the **Execution Results** view in the Extract Web App.

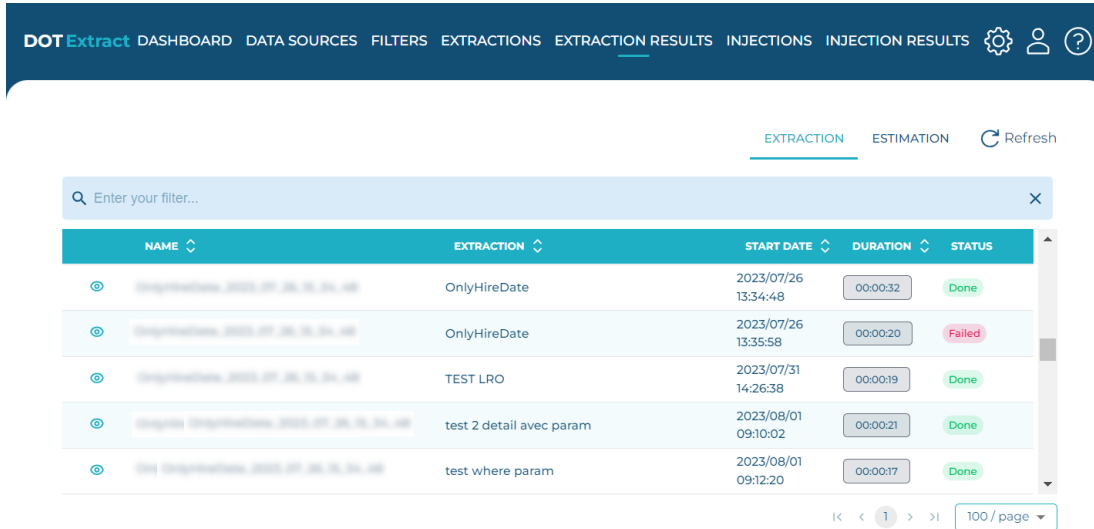


Figure 9: Extraction Results

13.1 Extraction workflow

When you launch an extraction with DOT Extract, it follows the steps below:

1. The extractor analyzes the database and defines a list of primary keys.
2. A SELECT query extracts the data by following the constraints.


Note
Additional rights and user privileges might be needed depending on the database type, to read the data of the schema/library to extract.
3. An archive database is generated with the structure and the extracted data.
4. The extraction process takes the data model and the extraction instructions to create an archive and the extraction results.

13.2 Extraction results overview

The extraction instance is generated when the extraction is launched. To see all the extraction results updated, click the **Refresh** button.

The extraction results show for each execution of an extraction, the **Start Date** and the **Duration** of the extraction instance. The **Status** indicates if the extraction is **On Going**, **Done** or **Failed**.

When the extraction status is **On Going**, you can hover the status to have more information about the execution progress.

To stop the execution of an on going extraction, click the  View button then click the  Stop button. The status of the extraction is then **Stopped**.

To view the data extracted and stored in the Extract Server H2 database, click the  View button.

13.3 View extraction results logs

To display the details of the extraction process, click the  View button to open the logs and details page, then click the **Details** button.


 **Note**
The **Table Name** column also displays the schema that contains each table used for the extraction result.

Table name	Description
Table Name	Refers to the name of the tables that are extracted.
DB Lines	Indicates the number of lines of the table that are included in the database.
DB Size in KB	Indicates the size of the database in Kilobytes, that is calculated for the extraction.
Extracted Lines	Indicates the final number of lines of the table that are extracted, after being filtered for the extraction.
Extracted KB	Indicates the final size of the database in Kilobytes, that is extracted.
Lines %	Indicates the percentage of lines extracted, compared to the number of lines included in the database.
Size %	Indicates the percentage of the size of data extracted, compared to the total size of data contained in the database.


Table 12: Extraction results details

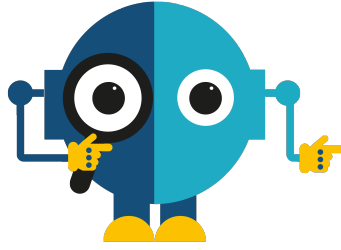
To display the logs of the extraction process, click the  View button to open the logs and details page, then click the **Logs** button.

13.4 Delete an extraction result

To delete an extraction result, click the  View button to open the **Edit** page of the extraction result, then click the  Delete button.

A confirmation dialog opens, click **Delete** to confirm, or **Cancel** to keep the extraction result.

 **Warning!**
Deleted extraction results cannot be accessed or recovered. The associated extracted data is deleted as well.



D.O.T

Injection

Introduction to the injection process

Once the extracted data is stored in the archive, you can proceed with the injection process.

The injection process ([Injections](#)) consists in taking the archived data and put it into the target data source. The target data source, where the data is injected, must contain the same tables name and structures as the extracted tables stored in the archive. The target data model must also be provided to precisely find the tables where to inject.

The [Injection results](#) are generated when the injection is launched and completed. The injection results consist in the execution instance logs.

14 Injections

Chapter Summary

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- 14.2 Manage injections 65

The injection process recreates the data subset in the chosen destination data source. The injection results is the log of the injection process.

Refresh Add

NAME	EXTRACTION RESULTS	DESTINATION(S)	INJECT
TST LRO injection with 1 branch table	TST LRO extraction with 1 branch table_2022_10_04_09_05_53	TST- LRO - ORACLE LRO	INJECT
TST LRO 01	TST LRO 01_2022_10_04_15_30_00	TST- LRO - ORACLE LRO2, cm5, cm_a	INJECT
TST LRO 02	TST LRO 01_2022_10_04_15_30_00		INJECT
TST LRO 03	TST LRO extraction with 1 branch table 02_2022_10_04_10_48_46	cm9, cm_a	INJECT
TST LRO 04	TST LRO extraction address_2022_10_04_14_14_48	cm9	INJECT

Figure 10: Injections view

Injections are accessed and managed in the **Injections** view.

14.1 Prerequisites

The users that perform the injection must have the following user privileges on the target database tables, if they are not the owner of the objects.

Database	User privileges
MySQL	USAGE, SELECT, INSERT or UPDATE
MS SQL Server	SELECT, INSERT, UPDATE or ALTER
Oracle	SELECT, INSERT, UPDATE or ALTER
DB2 for i	SELECT, INSERT or UPDATE
PostgreSQL	The user must be the owner of the table. Required by the ALTER TABLE for referential constraints.

Table 13: User privileges required for injections

14.2 Manage injections

14.2.1 Create an injection

Follow the subsequent steps to create a new injection.

Step 1 Click on the **Injections** tab to open the **Injections** view, then click the  **Add** button.

Step 2 Define the Main Properties required for the new injection.

Name

Enter a unique **Name** for the new injection.

Extraction Result



Select an **Extraction Result** in the drop-down list.

Click **Next**.

Step 3 Select the Target Data Sources required for the injection.

Data Source

Select a **Data Source** in the drop-down list.

You can select multiple destinations in the list to create multiple injections. To do so, click the  **Add** button to confirm the selected data source and to be able to define another, if necessary. To remove a data source in the list, click the  **Delete** button.


Note



In case of multiple injections, the data is injected successively into the selected destinations and not simultaneously.

Multiple injections are exclusively possible on databases with the same type and structure as the source database used for the extraction.

Step 4 Click **DONE** to validate the injection and close the dialog.


Result The new injection is created and appears in the list of injections.

To create an injection project, you can also duplicate an existing one and make changes. To do so, click the  Duplicate button, edit the name for the duplicated project in the dialog and click **Done**. By default, the duplicated project is name after the original project appended with the *-copy* mention. You can also enter an entirely **New Name** for the duplicated project.

To edit an injection, click the  View button to view the details of the injection project, then click the  Edit button. The **Edit** page opens and enables you to edit the **Name**, the **Extraction Result** and the target data source(s).

Important!

Make sure you click the  **Add** button when you select an additional data

source for injection, to save it and add another one. Click the  Delete button to remove an existing data source.

Click the  Save button to save the changes.

14.2.2 Execute an injection

To execute an injection, click the **Inject** button. A dialog opens to confirm that the injection is launched. You can track the status and the results of the injection in the **Injection Results** view.



Important!

During the injection process, conflicts can occur if a row waiting for injection is already present in the target table. In that case, DOT Extract merges the data of the impacted table from the archive. The merge process updates the existing rows and inserts rows that do not exist yet. Performance impact on merge processes can be serious.

Reference

For more information about the Injection Results, refer to [Injection results](#) on page 67.

14.2.3 Delete an injection

To delete an injection result, click the  View button to open the **Edit** page of the injection, then click the  Delete button.

A confirmation dialog opens, click **Delete** to confirm, or **Cancel** to keep the injection.

Warning!

Deleted injections cannot be accessed or recovered.

15 Injection results


The results of an injection instance are accessed and managed in the **Injection Results** view in the Extract Web App.

15.1 Injection workflow

When you launch an injection, it follows the steps below:

1.	Disable the target foreign key constraints.
2.	Insert data in the target schema from the archive.
3.	Enable the target foreign key constraints. <div style="border: 1px dashed orange; padding: 5px; margin: 5px 0;"><p>⚠ Important! If an error occurs during the activation of the target foreign key constraints, the injection is incomplete, and some of the data is inconsistent or missing.</p></div>

15.2 Injection results overview

The injection instance is generated when the injection is launched. To see all the injection results, click the  **Refresh** button.

The injection results show for each execution of an injection, the **Start Date** and the **Duration** of the injection instance. The **Status** indicates if the extraction is **On Going**, **Done** or **Failed**.



When the extraction status is On Going, you can hover the status to have more information about the execution progress.

To stop the execution of an on going injection, click the  View button then click the  Stop button. The status of the injection is then **Stopped**.

To view the data injected, click the  View button.

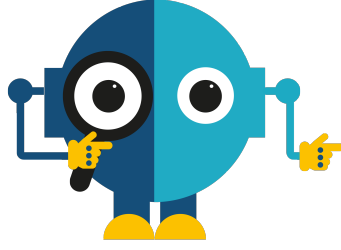
To display the logs of the injection process, click the  View button to open the logs and details page, then click the **Logs** button.

15.3 Delete an injection result

To delete an injection result, click the  View button to open the **Edit** page of the injection result, then click the  Delete button.

A confirmation dialog opens, click **Delete** to confirm, or **Cancel** to keep the injection result.

⚠ Warning!
Deleted injection results cannot be accessed or recovered.



D.O.T

Appendix

Command Line Interface (CLI)

The DOT Extract Command Line Interface is used to execute predefined extraction and injection processes from the command line. Use the CLI to:

- execute extraction and injection projects,
- list the execution parameters of an extraction execution,
- create data sources and injection projects directly from the CLI.

The DOT Extract CLI is distributed as a zip file. Extract the content into the folder of your choice. Go to the `/bin` folder to launch the CLI.

Note

The CLI needs to have access to a Java 8 Runtime Environment that needs to be installed and accessible from anywhere in a command line terminal (run `<code>java -version </code>` to find the current accessible Java version).

To call any action using the CLI, the following syntax is used: `extract <subcommand> <parameters>`.

Each subcommand requires one or more parameters. To display the list of supported parameters for any subcommand, run the subcommand without any parameters. If nothing is provided, the system prompts you to fill in the blanks required to accomplish the subcommands tasks.

Parameters between *[brackets]* are optional. Each parameter has a long and a short form (example: `--project`, `-p`) and are separated from their value by the equal sign `=` or a space.

- `executeExtraction`,
- `executeInjection`,
- `listParameters`
- `createInjectionProject`, and
- `createDatasource`.

Common parameters

The following parameters are common to all CLI commands.

`-H, --help`

Display the help message for the command.

`-S, --server`

[Required] The URL of the Extract Server to which to connect.

`-U, --user`

[Required] The user used to connect to the Extract Server.

`-P, --password`

[Required] The password used to connect to the Extract Server.

`-C, --encrypted`

Required if the password is Base64 encrypted.

-L, --log-file

The path to the file where the logs will be written.

-V, --verbose

Enable debug and trace log levels.

executeExtraction

This command allows you to execute an extraction based on an Extraction project passed as a parameter. With this command, the extraction is prepared and executed.

Usage: extract listParameters [-CHV] -P[=<password>] [-P[=<password>]]...[-L=<logFile>] [-p=<extractionProjectName>]-S=<serverURL> -U=<user>[-x=<extractionInstanceName>]

The available parameters for the executeExtraction subcommand are the following:

-p, --project

The name of the Extraction project used to execute the extraction.

--param

An Extraction execution parameter.

--var

An Extraction execution variable for extractions launched with parameters.

-rs, --refreshstatistics

If set to true, this parameter refreshes the statistics one the data source before launching the execution.

executeInjection

This command allows you to execute an injection based on an Injection project passed as a parameter. With this command, the Injection is prepared and executed.

Usage: extract executeInjection [-CHV] -P[=<password>] [-P[=<password>]] [-L=<logFile>] -p=<extractionProjectName>S=<serverURL> -U=<user>

The available parameters for the executeInjection subcommand are the following:

-p, --project

The name of the Injection project used for the injection execution.

listParameters

This command allows you to retrieve the list of the execution parameters of a specified extraction execution.

Usage: extract listParameters [-CHV] -P[=<password>] [-P[=<password>]]...[-L=<logFile>] -S=<serverURL> -U=<user>-x=<extractionInstanceName>

The available parameters for the elistParameters subcommand are the following:

-p, --extractionProject

The name of an Extraction Project to retrieve its corresponding list of parameters.

-x, --extraction

The name of the Extraction execution to retrieve its corresponding list of parameters.

createInjectionProject

This command allows you to create an Injection project directly from the CLI.

Usage: extract createInjectionProject [-CHVx] -P[=<password>] [-P[=<password>]]... [-L=<logFile>]-n=<injectionProjectName> -S=<serverURL>-t=<datasourceType> -U=<user>-xn=<extractionExecutionName>-d=<datasourceNames>[-d=<datasourceNames>]

The available parameters for the createInjectionProject subcommand are the following:

-d, --datasource

The name of a target data source linked to the Injection project.

-n, --name

The name of the Injection project.

-t, --type

The data source type. The value is an integer, each type of data source corresponds to a number, which is used in the CLI.

- **1** corresponds to PostgreSQL
- **2** corresponds to DB2 for i,
- **3** corresponds to MsSQL,
- **4** corresponds to Oracle, and
- **5** corresponds to MySQL.

-x, --execute

Indicates whether the Injection project must be executed after its creation.

-xn, --extraction

The name of the Extraction execution that is used by the newly created Injection project.

createDatasource

This command allows you to create a new data source directly from the CLI.

Usage: extract createDatasource [-CHV] -P[=<password>] [-P[=<password>]]...[-a=<application>] [-e=<environment>]-l=<datasourceLogin> [-L=<logFile>]-n=<datasourceName> -pw=<datasourcePassword>[-r=<readonly>] -s=<datasourceSchemas>-S=<serverURL> t=<datasourceType>-u=<datasourceUrl> -U=<user> [-v=<version>]

The available parameters for the createDatasource subcommand are the following:

-a, --application [Optional, for DB2 for i]

Sets the ARCAD Application Code.

-arch, --archive

Indicates if the data source is used as archive, to store the extraction results. The possible values are **0** to keep the usual H2 file as storage for extraction results and **1** to use this new data source exclusively for archiving.

**Important!**

If the data source is used as archive, there is no extraction possible on this data source.

-e, --environment [*Optional, for DB2 for i*]

Sets the ARCAD Environment ID Code.

-l, --login

The user name needed to log in.

-n, --name

The name of the new data source to create.

-pw, --datasourcepassword

The password used to connect to the data source.

-r, --readonly

Indicates if the data source is protected. The possible values are **0** to keep the data source unprotected, and **1** to protect the data source.

**Important!**

If the data source is protected, it means that it is in read-only mode and there is no injection possible on this data source.

-s, --schemas

Sets the data source schema. You can set several schemas separated by a semicolon, to create a multi-schema data source.

-t, --type

Sets the data source type. The value is an integer, each type of data source corresponds to a number, which is used in the CLI.

- **1** corresponds to PostgreSQL
- **2** corresponds to DB2 for i,
- **3** corresponds to MS SQL Server,
- **4** corresponds to Oracle, and
- **5** corresponds to MySQL.

-u, --url

Sets the URL of the data source.

-v, --version [*Optional, for DB2 for i*]

Sets the ARCAD Version.

Glossary

A

Archive

An independent container, usually an H2 file, but it can also be any type of data source set in DOT Extract, that stores all the extracted data, the meta data of the extraction and injection tasks, as well as the administrative information.

C

Cache

There are two types of caches: the regular engine cache and the engine execution cache. The engine cache is permanent, unless you voluntarily clear the cache. The engine execution cache is temporary and is cleared at the end of the execution of the project or the chain of projects.

D

Data Model

A modelization of the structure of the data in a data source. It contains all the elements necessary to be able to structure data.

Data Source

Databases that contain the data. - The source data source is the database where the data to subset is extracted from. - The target data source is the database where the data subset is injected to.

E

Extraction

Process that consists of getting a set of consistent data from a source and create an archive stored in a H2 database file in the DOT Extract Server, while guaranteeing the referential integrity of the database.

Extraction Mode

Type of extraction that is made on a data source.

Extraction Package

The data extraction package is composed of the extraction request that defines the scope of data to extract and the archive that defines the media to store the extracted data. The extraction package defines the extraction and injection jobs.

Extraction Request

Defines the extent of data to be extracted. The extraction request retrieves the extraction mode and contains the extraction branches.

F

Filter

Where clause that defines the table from which the data is extracted and other filtering clauses on the data to extract.

I

Injection

Process that consists of installing extracted data from an extraction backup into one or several databases (datasources). DOT Extract manages repeatable and multiple injections.

R

Relational Database Management System (RDBMS)

A collection of hardware and software that organizes and provides access to a relational database.