The MySQL Foreign Data Wrapper (mysql_fdw) is a Postgres extension that allows you to access data that resides on a MySQL database from EDB Postgres Advanced Server. It is a writable foreign data wrapper that you can use with Postgres functions and utilities, or in conjunction with other data that resides on a Postgres host.

The MySQL Foreign Data Wrapper can be installed with an RPM package. You can download an installer from the EDB website.

This guide uses the term Postgres to refer to an instance of EDB Postgres Advanced Server.
CHAPTER 1

What’s New

The following features are added to create MySQL Foreign Data Wrapper 2.5.5:

- Support for EDB Postgres Advanced Server 13.
- Support for Ubuntu 20.04 LTS platform.
CHAPTER 2

Requirements Overview

2.1 Supported Versions

The MySQL Foreign Data Wrapper is certified with EDB Postgres Advanced Server 9.5 and above.

2.2 Supported Platforms

The MySQL Foreign Data Wrapper is supported on the following platforms:

**Linux x86-64**
- RHEL 8.x/7.x
- CentOS 8.x/7.x
- OEL 8.x/7.x
- Ubuntu 20.04/18.04 LTS
- Debian 10.x/9.x

**Linux on IBM Power8/9 (LE)**
- RHEL 7.x
The MySQL data wrapper provides an interface between a MySQL server and a Postgres database. It transforms a Postgres statement (SELECT/INSERT/DELETE/UPDATE) into a query that is understood by the MySQL database.

Fig. 1: Using mysql_fdw with Postgres
The MySQL Foreign Data Wrapper can be installed with an RPM package. During the installation process, the installer will satisfy software prerequisites.

4.1 Installing the MySQL Foreign Data Wrapper using an RPM Package

You can install the MySQL Foreign Data Wrapper using an RPM package on the following platforms:

- RHEL 7
- RHEL 8
- CentOS 7
- CentOS 8
4.1.1 On RHEL 7

Before installing the MySQL Foreign Data Wrapper, you must install the following prerequisite packages and request credentials from EDB:

Install the `epel-release` package:

```
```

Enable the optional, extras, and HA repositories:

```
subscription-manager repos --enable "rhel-**-optional-rpms" --
enable "rhel-**-extras-rpms" --enable "rhel-ha-for-rhel-**-
server-rpms"
```

You must also have credentials that allow access to the EDB repository. For information about requesting credentials, visit:


After receiving your repository credentials:

1. Create the repository configuration file.
2. Modify the file, providing your user name and password.
3. Install the MySQL Foreign Data Wrapper.

Creating a Repository Configuration File

To create the repository configuration file, assume superuser privileges, and invoke the following command:

```
yum -y install https://yum.enterprisedb.com/edbrepos/edb-repo-
latest.noarch.rpm
```

The repository configuration file is named `edb.repo`. The file resides in `/etc/yum.repos.d`.

Modifying the file to provide your user name and password

After creating the `edb.repo` file, use your choice of editor to ensure that the value of the `enabled` parameter is `1`, and replace the `username` and `password` placeholders in the `baseurl` specification with the name and password of a registered EDB user.

```
[edb]
name=EnterpriseDB RPMs $releasever - $basearch
baseurl=https://<username>:<password>@yum.enterprisedb.com/
<edb/redhat/rhel-$releasever-$basearch
```

(continues on next page)
Installing the MySQL Foreign Data Wrapper

After saving your changes to the configuration file, use the following command to install the MySQL Foreign Data Wrapper:

```
yum install edb-as<xx>-mysql<x>_fdw
```

where $xx$ is the server version number, and $x$ is the supported release version number of MySQL. For example, to install MySQL 5.0 on RHEL 7:

```
yum install edb-as<xx>-mysql5_fdw
```

**Note:** MySQL 8.0 and MySQL 5.0 RPMs are available for RHEL 7 platform.

When you install an RPM package that is signed by a source that is not recognized by your system, yum may ask for your permission to import the key to your local server. If prompted, and you are satisfied that the packages come from a trustworthy source, enter `y`, and press `Return` to continue.

During the installation, yum may encounter a dependency that it cannot resolve. If it does, it will provide a list of the required dependencies that you must manually resolve.
4.1.2 On RHEL 8

Before installing the MySQL Foreign Data Wrapper, you must install the following prerequisite packages and request credentials from EDB:

Install the `epel-release` package:

```
```

Enable the `codeready-builder-for-rhel-8-\*-rpms` repository:

```
ARCH=$( /bin/arch )
subscription-manager repos --enable "codeready-builder-for-rhel-8-$ARCH-rpms"
```

You must also have credentials that allow access to the EDB repository. For information about requesting credentials, visit:


After receiving your repository credentials:

1. Create the repository configuration file.
2. Modify the file, providing your user name and password.
3. Install the MySQL Foreign Data Wrapper.

Creating a Repository Configuration File

To create the repository configuration file, assume superuser privileges, and invoke the following command:

```
dnf -y https://yum.enterprisedb.com/edbrepos/edb-repo-latest.noarch.rpm
```

The repository configuration file is named `edb.repo`. The file resides in `/etc/yum.repos.d`.

Modifying the file to provide your user name and password

After creating the `edb.repo` file, use your choice of editor to ensure that the value of the `enabled` parameter is 1, and replace the `username` and `password` placeholders in the `baseurl` specification with the name and password of a registered EDB user.

```
[edb]
name=EnterpriseDB RPMs $releasever - $basearch
baseurl=https://<username>:<password>@yum.enterprisedb.com/edb/redhat/rhel-$releasever-$basearch
```

(continues on next page)
## Installing the MySQL Foreign Data Wrapper

After saving your changes to the configuration file, use the following command to install the MySQL Foreign Data Wrapper:

```bash
dnf install edb-as<xx>-mysql8_fdw
```

When you install an RPM package that is signed by a source that is not recognized by your system, yum may ask for your permission to import the key to your local server. If prompted, and you are satisfied that the packages come from a trustworthy source, enter `y`, and press `Return` to continue.

During the installation, yum may encounter a dependency that it cannot resolve. If it does, it will provide a list of the required dependencies that you must manually resolve.
4.1.3 On CentOS 7

Before installing the MySQL Foreign Data Wrapper, you must install the following prerequisite packages and request credentials from EDB:

Install the `epel-release` package:

```
```

**Note:** You may need to enable the `[extras]` repository definition in the `CentOS-Base.repo` file (located in `/etc/yum.repos.d`).

You must also have credentials that allow access to the EDB repository. For information about requesting credentials, visit:


After receiving your repository credentials:

1. Create the repository configuration file.
2. Modify the file, providing your user name and password.
3. Install the MySQL Foreign Data Wrapper.

**Creating a Repository Configuration File**

To create the repository configuration file, assume superuser privileges, and invoke the following command:

```
yum -y install https://yum.enterprisedb.com/edbrepos/edb-repo-latest.noarch.rpm
```

The repository configuration file is named `edb.repo`. The file resides in `/etc/yum.repos.d`.

**Modifying the file to provide your user name and password**

After creating the `edb.repo` file, use your choice of editor to ensure that the value of the `enabled` parameter is `1`, and replace the `username` and `password` placeholders in the `baseurl` specification with the name and password of a registered EDB user.

```
[edb]
name=EnterpriseDB RPMs $releasever - $basearch
baseurl=https://<username>:<password>@yum.enterprisedb.com/
edb/redhat/rhel-$releasever-$basearch
enabled=1
```

(continues on next page)
Installing MySQL Foreign Data Wrapper

After saving your changes to the configuration file, use the following command to install the MySQL Foreign Data Wrapper:

```
yum install edb-as<xx>-mysql<x>_fdw
```

where xx is the server version number, and x is the supported release version number of MySQL. For example, to install MySQL 5.0 on CentOS 7:

```
yum install edb-as<xx>-mysql5_fdw
```

**Note:** MySQL 8.0 and MySQL 5.0 RPMs are available for CentOS 7 platform.

When you install an RPM package that is signed by a source that is not recognized by your system, yum may ask for your permission to import the key to your local server. If prompted, and you are satisfied that the packages come from a trustworthy source, enter `y`, and press Return to continue. During the installation, yum may encounter a dependency that it cannot resolve. If it does, it will provide a list of the required dependencies that you must manually resolve.
4.1.4 On CentOS 8

Before installing the MySQL Foreign Data Wrapper, you must install the following prerequisite packages and request credentials from EDB:

Install the `epel-release` package:

```
```

Enable the `PowerTools` repository:

```
dnf config-manager --set-enabled PowerTools
```

You must also have credentials that allow access to the EDB repository. For information about requesting credentials, visit:


After receiving your repository credentials:

1. Create the repository configuration file.
2. Modify the file, providing your user name and password.
3. Install the MySQL Foreign Data Wrapper.

Creating a Repository Configuration File

To create the repository configuration file, assume superuser privileges, and invoke the following command:

```
dnf -y install https://yum.enterprisedb.com/edbrepos/edb-repo-latest.noarch.rpm
```

The repository configuration file is named `edb.repo`. The file resides in `/etc/yum.repos.d`.

Modifying the file to provide your user name and password

After creating the `edb.repo` file, use your choice of editor to ensure that the value of the `enabled` parameter is 1, and replace the `username` and `password` placeholders in the `baseurl` specification with the name and password of a registered EDB user.

```
[edb]
name=EnterpriseDB RPMs $releasever - $basearch
baseurl=https://<username>:<password>@yum.enterprisedb.com/edb/redhat/rhel-$releasever-$basearch
enabled=1
gpgcheck=1
gpgkey=file:///etc/pki/rpm-gpg/ENTERPRISEDB-GPG-KEY
```
Installing MySQL Foreign Data Wrapper

After saving your changes to the configuration file, use the following command to install the MySQL Foreign Data Wrapper:

```
dnf install edb-as<xx>-mysql8_fdw
```

where \texttt{xx} is the server version number.

When you install an RPM package that is signed by a source that is not recognized by your system, yum may ask for your permission to import the key to your local server. If prompted, and you are satisfied that the packages come from a trustworthy source, enter \texttt{y}, and press \texttt{Return} to continue.

During the installation, yum may encounter a dependency that it cannot resolve. If it does, it will provide a list of the required dependencies that you must manually resolve.
4.2 Installing the MySQL Foreign Data Wrapper on a Debian or Ubuntu Host

To install the MySQL Foreign Data Wrapper on a Debian or Ubuntu host, you must have credentials that allow access to the EDB repository. To request credentials for the repository, visit the EDB website.

The following steps will walk you through on using the EDB apt repository to install a Debian package. When using the commands, replace the `username` and `password` with the credentials provided by EDB.

1. Assume superuser privileges:

   ```
   sudo su -
   ```

2. Configure the EnterpriseDB repository:

   On Debian 9:
   ```bash
   sh -c 'echo "deb https://username:password@apt.enterprisedb.com/$(lsb_release -cs)-edb/ $(lsb_release -cs) main" > /etc/apt/sources.list.d/edb-$(lsb_release -cs).list'
   ```

   On Debian 10:
   ```bash
   a. Set up the EDB repository:
   sh -c 'echo "deb [arch=amd64] https://apt.enterprisedb.com/ $(lsb_release -cs)-edb/ $(lsb_release -cs) main" > /etc/apt/sources.list.d/edb-$(lsb_release -cs).list'
   
   b. Substitute your EDB credentials for the `username` and `password` in the following command:
   ```bash
   sh -c 'echo "machine apt.enterprisedb.com login <username> <password>" > /etc/apt/auth.conf.d/edb.conf'
   ```

3. Add support to your system for the secure APT repositories:

   ```
   apt-get install apt-transport-https
   ```

4. Add the EBD signing key:

   ```
   wget -q -O - https://username:password@apt.enterprisedb.com/edb-deb.gpg.key | apt-key add -
   ```

5. Update the repository metadata:

   ```
   ```

---

4.2. Installing the MySQL Foreign Data Wrapper on a Debian or Ubuntu Host  14
apt-get update

6. Install the Debian package:

apt-get install edb-as<xx>-mysql-fdw

where xx is the server version number.
The key features of the MySQL Foreign Data Wrapper are listed below:

5.1 Writable FDW

The MySQL Foreign Data Wrapper allows you to modify content stored on a MySQL server from a PostgreSQL server. Users can INSERT, UPDATE and DELETE data in the remote MySQL tables by inserting, updating and deleting the data locally in the foreign tables. MySQL foreign data wrapper uses the Postgres type casting mechanism to provide opposite type casting between MySQL and Postgres data types.

Note: The first column of MySQL table must have unique/primary key for DML to work.

See also:

*Example: Using the MySQL Foreign Data Wrapper*

*Data Type Mappings*
5.2 Connection Pooling

The MySQL_FDW establishes a connection to a foreign server during the first query that uses a foreign table associated with the foreign server. This connection is kept and reused for subsequent queries in the same session.

5.3 WHERE Clause Push-down

The MySQL Foreign Data Wrapper allows the push-down of WHERE clauses to the foreign server for execution. This feature optimizes remote queries to reduce the number of rows transferred from foreign servers.

5.4 Column Push-down

The MySQL Foreign Data Wrapper supports selective column push-down. As a result, the query brings back only those columns that are a part of the select target list.

5.5 Prepared Statement

The MySQL Foreign Data Wrapper supports prepared statements. The select queries uses prepared statements instead of simple query protocol.

5.6 Import Foreign Schema

The MySQL Foreign Data Wrapper allows you to import foreign schemas; this allows the local host to import table definitions to the Advanced Server host from the MySQL server. The new foreign tables are created with the corresponding column types and same table name as that of remote tables in the existing local schema.

See also:

Example: Import Foreign Schema
5.7 Automated Cleanup

The MySQL Foreign Data Wrapper allows the cleanup of foreign tables in a single operation using the `DROP EXTENSION` command. This feature is specifically useful when a foreign table is created for a temporary purpose, as in case of data migration. The syntax is:

```
DROP EXTENSION mysql_fdw CASCADE;
```

For more information, see `DROP EXTENSION`. 
Before using the MySQL Foreign Data Wrapper, you must:

1. Use the `CREATE EXTENSION` command to create the MySQL Foreign Data Wrapper extension on the Postgres host.

2. Use the `CREATE SERVER` command to define a connection to the MySQL server.

3. Use the `CREATE USER MAPPING` command to define a mapping that associates a Postgres role with the server.

4. Use the `CREATE FOREIGN TABLE` command to define a single table in the Postgres database that corresponds to a table that resides on the MySQL server or use the `IMPORT FOREIGN SCHEMA` command to import multiple remote tables in the local schema.

### 6.1 CREATE EXTENSION

Use the `CREATE EXTENSION` command to create the `mysql_fdw` extension. To invoke the command, use your client of choice (for example, `psql`) to connect to the Postgres database from which you will be querying the MySQL server, and invoke the command:

```
CREATE EXTENSION [IF NOT EXISTS] mysql_fdw [WITH] [SCHEMA schema_name];
```

**Parameters**

- `IF NOT EXISTS`
Include the IF NOT EXISTS clause to instruct the server to issue a notice instead of throwing an error if an extension with the same name already exists.

`schema_name`

Optionally specify the name of the schema in which to install the extension’s objects.

**Example**

The following command installs the MySQL foreign data wrapper:

```sql
CREATE EXTENSION mysql_fdw;
```

For more information about using the foreign data wrapper `CREATE EXTENSION` command, see:

[https://www.postgresql.org/docs/current/static/sql-createextension.html](https://www.postgresql.org/docs/current/static/sql-createextension.html).
6.2 CREATE SERVER

Use the CREATE SERVER command to define a connection to a foreign server. The syntax is:

```
CREATE SERVER server_name FOREIGN DATA WRAPPER mysql_fdw
   [OPTIONS (option 'value' [, ...])]
```

The role that defines the server is the owner of the server; use the ALTER SERVER command to reassign ownership of a foreign server. To create a foreign server, you must have USAGE privilege on the foreign-data wrapper specified in the CREATE SERVER command.

**Parameters**

`server_name`

Use `server_name` to specify a name for the foreign server. The server name must be unique within the database.

**FOREIGN_DATA_WRAPPER**

Include the FOREIGN_DATA_WRAPPER clause to specify that the server should use the mysql_fdw foreign data wrapper when connecting to the cluster.

**OPTIONS**

Use the OPTIONS clause of the CREATE SERVER command to specify connection information for the foreign server. You can include:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>host</td>
<td>The address or hostname of the MySQL server. The default value is 127.0.0.1.</td>
</tr>
<tr>
<td>port</td>
<td>The port number of the MySQL Server. The default is 3306.</td>
</tr>
<tr>
<td>secure_auth</td>
<td>Use to enable or disable secure authentication. The default value is true.</td>
</tr>
<tr>
<td>init_command</td>
<td>The SQL statement to execute when connecting to the MySQL server.</td>
</tr>
<tr>
<td>ssl_key</td>
<td>The path name of the client private key file.</td>
</tr>
<tr>
<td>ssl_cert</td>
<td>The path name of the client public key certificate file.</td>
</tr>
<tr>
<td>ssl_ca</td>
<td>The path name of the Certificate Authority (CA) certificate file. This option, if used, must specify the same certificate used by the server.</td>
</tr>
<tr>
<td>ssl_capath</td>
<td>The path name of the directory that contains trusted SSL CA certificate files.</td>
</tr>
<tr>
<td>ssl_cipher</td>
<td>The list of permissible ciphers for SSL encryption.</td>
</tr>
<tr>
<td>use_remote_estimate</td>
<td>Include the use_remote_estimate to instruct the server to use EXPLAIN commands on the remote server when estimating processing costs. By default, use_remote_estimate is false.</td>
</tr>
</tbody>
</table>
Example

The following command creates a foreign server named `mysql_server` that uses the `mysql_fdw` foreign data wrapper to connect to a host with an IP address of `127.0.0.1`:

```sql
CREATE SERVER mysql_server FOREIGN DATA WRAPPER mysql_fdw OPTIONS
    (host '127.0.0.1', port '3306');
```

The foreign server uses the default port (3306) for the connection to the client on the MySQL cluster.

For more information about using the `CREATE SERVER` command, see:

https://www.postgresql.org/docs/current/static/sql-createserver.html
6.3 CREATE USER MAPPING

Use the CREATE USER MAPPING command to define a mapping that associates a Postgres role with a foreign server:

```
CREATE USER MAPPING FOR role_name SERVER server_name
  [OPTIONS (option 'value' [, ...])];
```

You must be the owner of the foreign server to create a user mapping for that server.

**Parameters**

**role_name**

Use `role_name` to specify the role that will be associated with the foreign server.

**server_name**

Use `server_name` to specify the name of the server that defines a connection to the MySQL cluster.

**OPTIONS**

Use the OPTIONS clause to specify connection information for the foreign server.

- `username`: the name of the user on the MySQL server.
- `password`: the password associated with the username.

**Example**

The following command creates a user mapping for a role named `enterprisedb`; the mapping is associated with a server named `mysql_server`:

```
CREATE USER MAPPING FOR enterprisedb SERVER mysql_server;
```

If the database host uses secure authentication, provide connection credentials when creating the user mapping:

```
CREATE USER MAPPING FOR public SERVER mysql_server OPTIONS (username 'foo', password 'bar');
```

The command creates a user mapping for a role named `public` that is associated with a server named `mysql_server`. When connecting to the MySQL server, the server will authenticate as `foo`, and provide a password of `bar`.

For detailed information about the CREATE USER MAPPING command, see:

```
https://www.postgresql.org/docs/current/static/sql-createuserrmapping.html
```
6.4 CREATE FOREIGN TABLE

A foreign table is a pointer to a table that resides on the MySQL host. Before creating a foreign table definition on the Postgres server, connect to the MySQL server and create a table; the columns in the table will map to columns in a table on the Postgres server. Then, use the CREATE FOREIGN TABLE command to define a table on the Postgres server with columns that correspond to the table that resides on the MySQL host. The syntax is:

```
CREATE FOREIGN TABLE [ IF NOT EXISTS ] table_name ( [ ...

| column_name data_type [ OPTIONS ( option 'value' [, ... ] ) ]

| COLLATE collation ] [ column_constraint [ ... ] ]

| table_constraint

[, ...]

] )

[ INHERITS ( parent_table [, ... ] ) ]

SERVER server_name [ OPTIONS ( option 'value' [, ... ] ) ]
```

where `column_constraint` is:

```
[ CONSTRAINT constraint_name ]

{ NOT NULL | NULL | CHECK (expr) [ NO INHERIT ] | DEFAULT default_expr

```

and `table_constraint` is:

```
[ CONSTRAINT constraint_name ] CHECK (expr) [ NO INHERIT ]
```

**Parameters**

`table_name`

Specifies the name of the foreign table; include a schema name to specify the schema in which the foreign table should reside.

`IF NOT EXISTS`

Include the `IF NOT EXISTS` clause to instruct the server to not throw an error if a table with the same name already exists; if a table with the same name exists, the server will issue a notice.

`column_name`

Specifies the name of a column in the new table; each column should correspond to a column described on the MySQL server.

`data_type`

Specifies the data type of the column; when possible, specify the same data type for each column on the Postgres server and the MySQL server. If a data type with the
same name is not available, the Postgres server will attempt to cast the data type to a type compatible with the MySQL server. If the server cannot identify a compatible data type, it will return an error.

**COLLATE** collation

Include the **COLLATE** clause to assign a collation to the column; if not specified, the column data type's default collation is used.

**INHERITS (parent_table [, ... ])**

Include the **INHERITS** clause to specify a list of tables from which the new foreign table automatically inherits all columns. Parent tables can be plain tables or foreign tables.

**CONSTRAINT** constraint_name

Specify an optional name for a column or table constraint; if not specified, the server will generate a constraint name.

**NOT NULL**

Include the **NOT NULL** keywords to indicate that the column is not allowed to contain null values.

**NULL**

Include the **NULL** keywords to indicate that the column is allowed to contain null values. This is the default.

**CHECK (expr) [NO INHERIT]**

Use the **CHECK** clause to specify an expression that produces a Boolean result that each row in the table must satisfy. A check constraint specified as a column constraint should reference that column's value only, while an expression appearing in a table constraint can reference multiple columns.

A **CHECK** expression cannot contain subqueries or refer to variables other than columns of the current row.

Include the **NO INHERIT** keywords to specify that a constraint should not propagate to child tables.

**DEFAULT default_expr**

Include the **DEFAULT** clause to specify a default data value for the column whose column definition it appears within. The data type of the default expression must match the data type of the column.

**SERVER** server_name [OPTIONS (option 'value' [, ... ] )]

To create a foreign table that will allow you to query a table that resides on a MySQL file system, include the **SERVER** clause and specify the **server_name** of the foreign server that uses the MySQL data adapter.
Use the **OPTIONS** clause to specify the following **options** and their corresponding values:

<table>
<thead>
<tr>
<th>option</th>
<th>value</th>
</tr>
</thead>
<tbody>
<tr>
<td>dbname</td>
<td>The name of the database on the MySQL server; the database name is required.</td>
</tr>
<tr>
<td>table_name</td>
<td>The name of the table on the MySQL server; the default is the name of the foreign table.</td>
</tr>
<tr>
<td>max_blob_size</td>
<td>The maximum blob size to read without truncation.</td>
</tr>
</tbody>
</table>

**Example**

To use data that is stored on MySQL server, you must create a table on the Postgres host that maps the columns of a MySQL table to the columns of a Postgres table. For example, for a MySQL table with the following definition:

```sql
CREATE TABLE warehouse (
    warehouse_id INT PRIMARY KEY,
    warehouse_name TEXT,
    warehouse_created TIMESTAMP);
```

You should execute a command on the Postgres server that creates a comparable table on the Postgres server:

```sql
CREATE FOREIGN TABLE warehouse
(
    warehouse_id INT,
    warehouse_name TEXT,
    warehouse_created TIMESTAMP
)  
SERVER mysql_server
    OPTIONS (dbname 'db', table_name 'warehouse');
```

Include the **SERVER** clause to specify the name of the database stored on the MySQL server and the name of the table (**warehouse**) that corresponds to the table on the Postgres server.

For more information about using the **CREATE FOREIGN TABLE** command, see:

https://www.postgresql.org/docs/current/static/sql-createforeigntable.html

**Note:** MySQL foreign data wrapper supports the write capability feature.
6.4.1 Data Type Mappings

When using the foreign data wrapper, you must create a table on the Postgres server that mirrors the table that resides on the MySQL server. The MySQL data wrapper will automatically convert the following MySQL data types to the target Postgres type:

<table>
<thead>
<tr>
<th>MySQL</th>
<th>Postgres</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIGINT</td>
<td>BIGINT/INT8</td>
</tr>
<tr>
<td>BOOLEAN</td>
<td>SMALLINT</td>
</tr>
<tr>
<td>BLOB</td>
<td>BYTEA</td>
</tr>
<tr>
<td>CHAR</td>
<td>CHAR</td>
</tr>
<tr>
<td>DATE</td>
<td>DATE</td>
</tr>
<tr>
<td>DOUBLE</td>
<td>DOUBLE PRECISION/FLOAT8</td>
</tr>
<tr>
<td>FLOAT</td>
<td>FLOAT/FLOAT4</td>
</tr>
<tr>
<td>INT/INTEGER</td>
<td>INT/INTEGER/INT4</td>
</tr>
<tr>
<td>LONGTEXT</td>
<td>TEXT</td>
</tr>
<tr>
<td>SMALLINT</td>
<td>SMALLINT/INT2</td>
</tr>
<tr>
<td>TIMESTAMP</td>
<td>TIMESTAMP</td>
</tr>
<tr>
<td>VARCHAR()</td>
<td>VARCHAR()/CHARACTER VARYING()</td>
</tr>
</tbody>
</table>

**Note:** For ENUM data type:

MySQL accepts enum values in string form. You must create exactly the same enum listing on Advanced Server as the values that is present on MySQL server. Any sort of inconsistency will result in an error while fetching rows with values not known on the local server.

Also, when the given enum value is not present at MySQL side but present at Postgres/Advanced Server side, an empty string ('') is inserted as a value at MySQL side for the enum column. To select from such a table having enum value as '', create an enum type at Postgres side with all valid values and '".'
6.5 IMPORT FOREIGN SCHEMA

Use the IMPORT FOREIGN SCHEMA command to import table definitions on the Postgres server from the MySQL server. The new foreign tables are created with the same column definitions as that of remote tables in the existing local schema. The syntax is:

```
IMPORT FOREIGN SCHEMA remote_schema
    [ { LIMIT TO | EXCEPT } ( table_name [, ...] ) ]
    FROM SERVER server_name
    INTO local_schema
    [ OPTIONS ( option 'value' [, ... ] ) ]
```

Parameters

remote_schema
   Specifies the remote schema (MySQL database) to import from.

LIMIT TO ( table_name [, ...] )
   By default, all views and tables existing in a particular database on the MySQL host are imported. Using this option, you can limit the list of tables to a specified subset.

EXCEPT ( table_name [, ...] )
   By default, all views and tables existing in a particular database on the MySQL host are imported. Using this option, you can exclude specified foreign tables from the import.

SERVER server_name
   Specify the name of server to import foreign tables from.

local_schema
   Specify the name of local schema where the imported foreign tables must be created.

OPTIONS
   Use the OPTIONS clause to specify the following options and their corresponding values:
<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>import_default</td>
<td>Controls whether column <em>DEFAULT</em> expressions are included in the definitions of foreign tables imported from a foreign server. The default is <em>false</em>.</td>
</tr>
<tr>
<td>import_not_null</td>
<td>Controls whether column <em>NOT NULL</em> constraints are included in the definitions of foreign tables imported from a foreign server. The default is <em>true</em>.</td>
</tr>
</tbody>
</table>

**Example**

For a MySQL table created in the *edb* database with the following definition:

```sql
CREATE TABLE color(cid INT PRIMARY KEY, cname TEXT);
INSERT INTO color VALUES (1, 'Red');
INSERT INTO color VALUES (2, 'Green');
INSERT INTO color VALUES (3, 'Orange');

CREATE TABLE fruit(fid INT PRIMARY KEY, fname TEXT);
INSERT INTO fruit VALUES (1, 'Orange');
INSERT INTO fruit VALUES (2, 'Mango');
```

You should execute a command on the Postgres server that imports a comparable table on the Postgres server:

```sql
IMPORT FOREIGN SCHEMA edb FROM SERVER mysql_server INTO public;

SELECT * FROM color;
```

```
<table>
<thead>
<tr>
<th>cid</th>
<th>cname</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Red</td>
</tr>
<tr>
<td>2</td>
<td>Green</td>
</tr>
<tr>
<td>3</td>
<td>Orange</td>
</tr>
</tbody>
</table>

(3 rows)
```

```sql
SELECT * FROM fruit;
```

```
<table>
<thead>
<tr>
<th>fid</th>
<th>fname</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Orange</td>
</tr>
<tr>
<td>2</td>
<td>Mango</td>
</tr>
</tbody>
</table>

(2 rows)
```

The command imports table definitions from a remote schema *edb* on server *mysql_server*
and then creates the foreign tables in local schema public.

For more information about using the IMPORT FOREIGN SCHEMA command, see:

https://www.postgresql.org/docs/current/static/sql-importforeignschema.html
CHAPTER 7

Example: Using the MySQL Foreign Data Wrapper

Access data from Advanced Server and connect to psql. Once you are connected to psql, follow the below steps:

```sql
-- load extension first time after install
CREATE EXTENSION mysql_fdw;

-- create server object
CREATE SERVER mysql_server
  FOREIGN DATA WRAPPER mysql_fdw
  OPTIONS (host '127.0.0.1', port '3306');

-- create user mapping
CREATE USER MAPPING FOR postgres
  SERVER mysql_server OPTIONS (username 'foo', password 'bar');

-- create foreign table
CREATE FOREIGN TABLE warehouse
  (warehouse_id INT,
   warehouse_name TEXT,
   warehouse_created TIMESTAMP)
  SERVER mysql_server
  OPTIONS (dbname 'db', table_name 'warehouse');

-- insert new rows in table
(continues on next page)
```
INSERT INTO warehouse values (1, 'UPS', current_date);
INSERT INTO warehouse values (2, 'TV', current_date);
INSERT INTO warehouse values (3, 'Table', current_date);

-- select from table
SELECT * FROM warehouse ORDER BY 1;

<table>
<thead>
<tr>
<th>warehouse_id</th>
<th>warehouse_name</th>
<th>warehouse_created</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>UPS</td>
<td>10-JUL-20 00:00:00</td>
</tr>
<tr>
<td>2</td>
<td>TV</td>
<td>10-JUL-20 00:00:00</td>
</tr>
<tr>
<td>3</td>
<td>Table</td>
<td>10-JUL-20 00:00:00</td>
</tr>
</tbody>
</table>

-- delete row from table
DELETE FROM warehouse where warehouse_id = 3;

-- update a row of table
UPDATE warehouse set warehouse_name = 'UPS.NEW' where warehouse_id = 1;

-- explain a table with verbose option
EXPLAIN VERBOSE SELECT warehouse_id, warehouse_name FROM warehouse
WHERE warehouse_name LIKE 'TV' limit 1;

QUERY PLAN

<table>
<thead>
<tr>
<th>Limit (cost=10.00..11.00 rows=1 width=36)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output: warehouse_id, warehouse_name</td>
</tr>
<tr>
<td>-&gt; Foreign Scan on public.warehouse (cost=10.00..1010.00 rows=1000 width=36)</td>
</tr>
<tr>
<td>Output: warehouse_id, warehouse_name</td>
</tr>
<tr>
<td>Local server startup cost: 10</td>
</tr>
<tr>
<td>Remote query: SELECT <code>warehouse_id</code>, <code>warehouse_name</code> FROM <code>db</code>.<code>warehouse</code> WHERE (<code>warehouse_name</code> LIKE BINARY 'TV')</td>
</tr>
</tbody>
</table>
Example: Import Foreign Schema

Access data from Advanced Server and connect to psql. Once you are connected to psql, follow the below steps:

```sql
-- load extension first time after install
CREATE EXTENSION mysql_fdw;

-- create server object
CREATE SERVER mysql_server
    FOREIGN DATA WRAPPER mysql_fdw
    OPTIONS (host '127.0.0.1', port '3306');

-- create user mapping
CREATE USER MAPPING FOR postgres
    SERVER mysql_server OPTIONS (username 'foo', password 'bar');

-- import foreign schema
IMPORT FOREIGN SCHEMA edb FROM SERVER mysql_server INTO public;

SELECT * FROM color;
cid | cname
----+--------
  1 | Red
  2 | Green
  3 | Orange

SELECT * FROM fruit;
```

(continues on next page)
<table>
<thead>
<tr>
<th>fid</th>
<th>fname</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Orange</td>
</tr>
<tr>
<td>2</td>
<td>Mango</td>
</tr>
</tbody>
</table>
Identifying the MySQL Foreign Data Wrapper Version

The MySQL Foreign Data Wrapper includes a function that you can use to identify the currently installed version of the .so file for the data wrapper. To use the function, connect to the Postgres server, and enter:

```
SELECT mysql_fdw_version();
```

The function returns the version number:

```
mysql_fdw_version
-----------------
<xxxxxx>
```
In case you are experiencing issues with using MySQL 8 and MySQL_FDW, below is a list of solutions to some frequently seen issues:

**Authentication plugin ‘caching_sha2_password’ Error**

```
ERROR: failed to connect to MySQL: Authentication plugin 'caching_sha2_password' cannot be loaded: /usr/lib64/mysql/plugin/caching_sha2_password.so: cannot open shared object file: No such file or directory
```

Specify the authentication plugin as `mysql_native_password` and set a cleartext password value. The syntax:

```
ALTER USER 'username'@'host' IDENTIFIED WITH mysql_native_password BY '<password>';
```

**Note:** Refer to MySQL 8 documentation for more details on the above error.
CHAPTER 11

Conclusion

MySQL Foreign Data Wrapper Guide
Copyright © 2020 - 2020 EnterpriseDB Corporation.
All rights reserved.
EnterpriseDB® Corporation
34 Crosby Drive, Suite 201, Bedford, MA 01730, USA
T +1 781 357 3390 F +1 978 467 1307 E
info@enterprisedb.com
www.enterprisedb.com

• EnterpriseDB and Postgres Enterprise Manager are registered trademarks of EnterpriseDB Corporation. EDB and EDB Postgres are trademarks of EnterpriseDB Corporation. Oracle is a registered trademark of Oracle, Inc. Other trademarks may be trademarks of their respective owners.

• EDB designs, establishes coding best practices, reviews, and verifies input validation for the logon UI for EDB Postgres product where present. EDB follows the same approach for additional input components, however the nature of the product may require that it accepts freeform SQL, WMI or other strings to be entered and submitted by trusted users for which limited validation is possible. In such cases it is not possible to prevent users from entering incorrect or otherwise dangerous inputs.

• EDB reserves the right to add features to products that accept freeform SQL, WMI or other potentially dangerous inputs from authenticated, trusted users in the future, but will ensure
all such features are designed and tested to ensure they provide the minimum possible risk, and where possible, require superuser or equivalent privileges.

• EDB does not warrant that we can or will anticipate all potential threats and therefore our process cannot fully guarantee that all potential vulnerabilities have been addressed or considered.