



BKM_DATS: Databázové systémy

5. Exchanging Data

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Contents

- Exporting data from DB
- Importing data to DB
- Backups

Exporting Data

- Standard database backup tools can be used
- Specific SQL command
 - COPY table TO file
 - COPY (query) TO file
 - instead of file, stdout can also be used.
 - The option `WITH FORMAT CSV HEADER TRUE` produces a CSV file (for Excel, e.g.)
 - <https://www.postgresql.org/docs/12/sql-copy.html>

Importing Data

- Standard database recovery tools can be used (-:
- SQL command
 - `COPY table FROM file`
 - Reads the file and for each line inserts the data into the table.
 - First item is inserted into the first attribute, etc.
 - You may give the attributes to fill by:
 - `COPY table (A,B,C) FROM file`
 - Once again, the format and header can be used in options

Attaching Files as Tables

- Foreign Data Wrapper mechanism in PostgreSQL
 - allows to access external sources as regular “local” tables
- postgres_fdw
 - allows to attach a table from another PostgreSQL server
 - read-write access
- file_fdw
 - attaches a file (output of COPY command) as a table, so a CSV file too.
 - read-only access
- Needs to be activated
 - `CREATE EXTENSION extension_name;`

Attaching Files as Tables - postgres_fdw

- See documentation
 - <https://www.postgresql.org/docs/12/postgres-fdw.html>
- CREATE EXTENSION postgres_fdw;
 - activates the module
- CREATE SERVER db_fi
FOREIGN DATA WRAPPER postgres_fdw
OPTIONS (host 'db.fi.muni.cz', dbname 'pgdb', port '5432');
- Connection information only, excluding user and password
- CREATE USER MAPPING FOR CURRENT_USER SERVER db_fi
OPTIONS ("user" 'xxloginxx', password 'xxpwdxx');
- Set credentials to access the remote server for
“CURRENT_USER” / “PUBLIC” / particular user.

Attaching Files as Tables - postgres_fdw

- ❑ `IMPORT FOREIGN SCHEMA xxsch FROM SERVER db_fi INTO xxlocal;`
 - ❑ Import all tables in schema xxsch on the remote server into xxlocal schema.

- ❑ `CREATE FOREIGN TABLE predmet (
 INHERITS (xxsch.predmet) SERVER db_fi;`
 - ❑ Creates a table backed by the remote server.
 - ❑ <https://www.postgresql.org/docs/12/sql-createforeigntable.html>

Attaching Files as Tables - file_fdw

- See documentation
 - <https://www.postgresql.org/docs/12/file-fdw.html>
- CREATE EXTENSION file_fdw;
 - activates the module
- CREATE SERVER csv_file FOREIGN DATA WRAPPER file_fdw;
 - create a “remote server”
- CREATE FOREIGN TABLE csv
 (columns, ...)
 SERVER csv_file;
 OPTIONS (filename 'xxx', format 'csv', header '1');
 - Creates a table backed by a CSV file stored in the local server.

Backup & Restore

- DBMSes have tools for database backup & restore
 - Typically, you may select what to backup; and also what to restore
- PostgreSQL
 - `pg_dump dbname >dumpfile`
 - a client app that connect to DB server and get the contents of the database
 - output can be read by newer server versions or different architecture (32-bit vs 64-bit)
 - it does not dump information about roles or tablespaces (because those are cluster-wide rather than per-database).
 - `psql dbname <dumpfile`
 - restore the data from dumpfile into the dbname database
 - dbname must exist in advance; if not, do first:
 - `createdb -T template0 dbname`
 - `pg_dumpall`

Backup & Restore

- PostgreSQL
 - `pg_dumpall >dumpfile`
 - backs up each database in a given cluster, and also preserves roles and tablespace definitions
 - the option `--globals-only` can be used to dump just roles and tablespace definition.
 - `psql -f dumpfile postgres`
 - should be executed as a superuser
 - Dumpfiles are bulky, so it is wise to compress them.
- pgAdmin app
 - Check context menus on databases, tables, schemas for Backup and Restore