Alembic Database migrations

CONCEPTS

Always read an autogenerated script before running it: it misses some changes and can be wrong.

Models target_metadata
↓ `revision --autogenerate`
Script versions/*.py
↓ `upgrade`
Database alembic_version table

The database stores only the current revision id, in the alembic_version table.

SETUP

`alembic init <dir>`
Create scripts dir and alembic.ini

`alembic init -t async <dir>`
Init with the async template

`alembic -c <file> <cmd>`
Use another config file

Set sqlalchemy.url in alembic.ini or override it in env.py, and set target_metadata there to your models' MetaData.

CREATE REVISIONS

`alembic revision -m "<msg>"`
New empty migration script

`alembic revision --autogenerate -m "<msg>"`
Script from model vs. database diff

`alembic check`
Fail if models differ from scripts

RUN MIGRATIONS

`alembic upgrade head`
Migrate to the newest revision

`alembic upgrade +1`
Apply the next migration

`alembic upgrade <rev>`
Migrate up to a revision

`alembic downgrade -1`
Undo the last migration

`alembic downgrade <rev>`
Roll back to a revision

RUN MIGRATIONS (cont.)

`alembic downgrade base`
Roll back everything

`alembic upgrade <from>:<to> --sql`
Print SQL instead of running it

INSPECT

`alembic current`
Show the database's revision

`alembic current --check-heads`
Fail if database is not at head

`alembic history`
List revisions, newest first

`alembic history -v`
History with full details

`alembic heads`
Show newest revisions

BRANCHES AND REPAIR

`alembic merge heads -m "<msg>"`
Merge all heads into one

`alembic stamp head`
Mark database as up to date

INSIDE A SCRIPT

```
op.create_table("<t>",
sa.Column(...))
```
Create a table

```
op.add_column("<t>",
sa.Column(...))
```
Add a column

```
op.alter_column("<t>",
"<col>", ...)
```
Change type, null or name

Write downgrade() too, or downgrade will fail; a bare pass leaves the change in place.

CONFIG

`compare_type=True`
Detect column type changes (env.py)

Autogenerate does not detect table or column renames (it sees drop plus add); edit the script by hand to use rename ops.