PostGreSQL
Alternative open source database in PxWeb

Stefan Jul Gunnersen, Chief Adviser
Statistics Denmark
PX Meeting, September 2023

STATISTICS DENMARK

Current options for data sources in PxWeb

- (PX) File based
- Microsoft SQL
- Oracle
- Sybase

- How nice it would be to have a **license free database alternative** such as:
  - MySQL
  - MariaDB
  - **PostGreSQL**

Path to PostGres for Statistics Denmark

STATISTICS
DENMARK

- Let us talk about *the elephant in the room*
  (yes, pun intended, could not help myself)

- Strategy for Statistics Denmark (early days still…)

  – **Saving money!** Oracle is *really* expensive

  – In-house expert group chose PostGreSQL (or
    just *PostGres*) as *the* path for in-house DB tech

  – Free and open source with good documentation

  – Flexible hardware and server options

  – Feels a lot like Oracle in some ways

  – Behaves faster than Oracle in some scenarios

  – Oracle PL/SQL <u>can</u> be ported, just not so easily

Alias	
alabio	Debian (
prion	Amazon
hamerkop	Windows
mandrill	AIX 710(
sidewinder	NetBSD
massasauga	Amazon
skink	Debian S
morepork	OpenBS
hippopotamus	openSUSE openSUSE 15.3 gcc g(
loach	FreeBSD FreeBSD 12.2 clang clan
ruddy	SUSE Linux Enterprise Server 15 S
schnauzer	OpenBSD 7.3 clang 13.0.0 x86_64
koel	Fedora 36 gcc 12.2.1 x86_64
mantid	CentOS 7.9.2009 gcc 4.8.5 x86_64
cisticola	Loongnix-Server 8.4.0 GCC 8.3.0 (
eelpout	Debian bullseye gcc 10.2 aarch64
crake	Fedora 36 gcc 12.2.1 x86_64
snakefly	AmazonLinux@Graviton2 AL2 gcc
jay	openSUSE openSUSE 15.3 clang

PostgreSQL

Some of the server options listed at
https://buildfarm.postgresql.org/cgi-bin/show_status.pl

Making the connection to PxWeb

- Statistics Denmark's StatBank and its API uses Oracle

- <u>Experimentation</u> with PostGres as a replacement

  – Conversion: Oracle tables → PostGres tables

  – Prototype: *StatBank **API*** with PostGres

- Next up was PxWeb

  – Strategy: *Extend* PxWeb, <u>not</u> change/remove code

  – Oracle implementation used as template

  – Extra code was added to a limited amount of files

  – Added support for PostGres to some libraries (DLLs)

  – Added a library (DLL) for the menu system to work

  – Extended possibilities for configuration of PxWeb
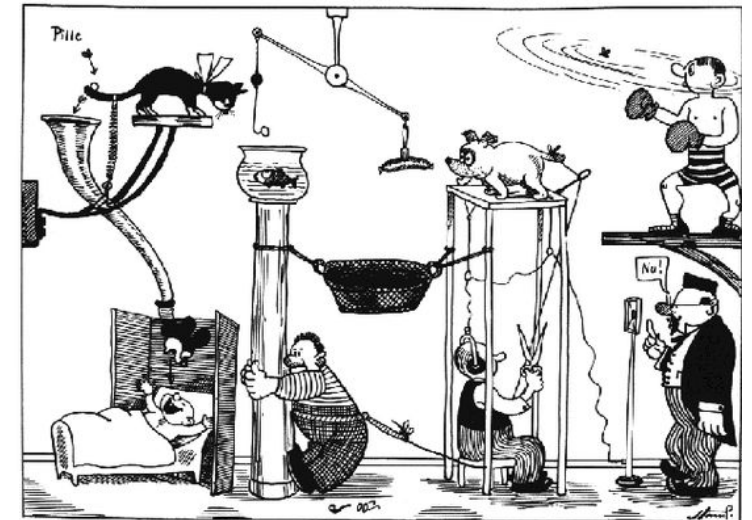
Source: Local PxWeb in Statistics Denmark
Documentation:
https://www.scb.se/en/services/statistical-programs-for-px-files/px-web

But … It is a **prototype**

- More ***proof of concept*** than finished work

  - Not much testing has been done

  - Unknown consequences if plugged into official PxWeb

  - "Plug and play" with <u>no errors</u> = too much time spent!

- Work lasted from January to May 2022 – "a long time ago"

- PostGres for PxWeb (and StatBank) lost focus

  - Still in focus in other places of Statistics Denmark

- Presented PostGres support for PX workgroup

  - "Interesting – can we hear more?"

  - <u>**Sorry**</u> that you never heard more – until now!

Distribution of PxWeb with PostGres

- It could be included in the **official PxWeb**!

  – However, multiple repositories are involved …

  – … so multiple Pull Requests are needed

  – Further testing *across PX projects* would reveal needed code changes

  – Maybe it is already outdated, because … PxWeb 2?

- **Local installation** to test integration with PostGres

  – Fetch and prepare <u>a lot of</u> source code (many projects)

    • https://github.com/statisticssweden

  – Overwrite and add some specific projects/files

  – Setup and debug using Visual Studio 2019+

Configuration of PxWeb with PostGres

- A PostGres server is running

  – CNMM 2.x (2.3 for us)

- All source code must be compiled across projects

- Manual adjustments

  – Point to local instances of DLLs

  – Tweak configuration file

    • PxWeb project -> SqlDb.config

- I'd love to demo it, but …

- … it is just the same as any other PxWeb!

Configuration for PostGreSQL

```xml
<?xml version="1.0" encoding="iso-8859-1"?>
<SqlDbConfig version="2008" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
        xsi:noNamespaceSchemaLocation="SqlDbConfig.xsd">
    <Database id="YOUR_ID" metaModel="2.YOUR_VERSION">
        <Connection databaseType="POSTGRES" dataProvider="PostGres"
                useTemporaryTables="false" metatablesSchema="postgres_schema">
            <ConnectionString>
                Host=server.website.domain;Username=postgres_appuser;
                Password=PASSWORD;Database=postgres_db;port=postgres_port;
            </ConnectionString>
            <DefaultUser>XXX</DefaultUser>
            <DefaultPassword>XXX</DefaultPassword>
        </Connection>
```

Configuration for Oracle

```xml
<SqlDbConfig version="2008" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
        xsi:noNamespaceSchemaLocation="SqlDbConfig.xsd">
    <Database id="YOUR_ID" metaModel="2.YOUR_VERSION">
        <!-- Attribute connectionStringAdapterType added by Statistics Denmark, May 2022 -->
        <Connection databaseType="ORACLE" dataProvider="Oracle"
                useTemporaryTables="false" metatablesSchema="Oracle_schema">
            <ConnectionString>Data Source=;User ID=USER;Password=PASSWORD</ConnectionString>
            <DefaultUser>XXX</DefaultUser>
            <DefaultPassword>XXX</DefaultPassword>
        </Connection>
```

Questions

- Is it really that hard to include PostGres for PxWeb?

  – Well, prototyping was manageable, but to implement it in production is something else

- We want PostGres support now! Can we get it?

  – Send an email to sjg@dst.dk

  – I will send you the files and a small guide

  – **But remember**: *It is a prototype!*

    - ***No responsibility*** *for loss of data or likewise!*

- Other questions?

Hope you feel inspired ...

Stefan Jul Gunnersen
Statistics Denmark