Welcome to this live webinar on DBPTK – an eArchiving solution for database archiving

Start 10:00 (CEST)

24 September 2020

Ground Rules for the Live Webinar

Click on “Connect audio” to hear the presenters but please mute your microphone throughout the webinar.

Submit your questions in writing by using the Webex chat function. We will answer some questions live during the webinar and provide written answers to all (within the coming days).

Please note that this webinar is recorded.

Agenda

10:00 – 10:05

Welcome

Thomas Fillis – CEF Stakeholder Management Office – DG DIGiT

10:05– 10:30

CEF Telecom call 2020-2: How to prepare a successful proposal

Adina Ratoi – CEF Telecom – INEA

10:30 – 11:15

DBPTK – an eArchiving solution for database archiving

Luis Faria – Keep Solutions

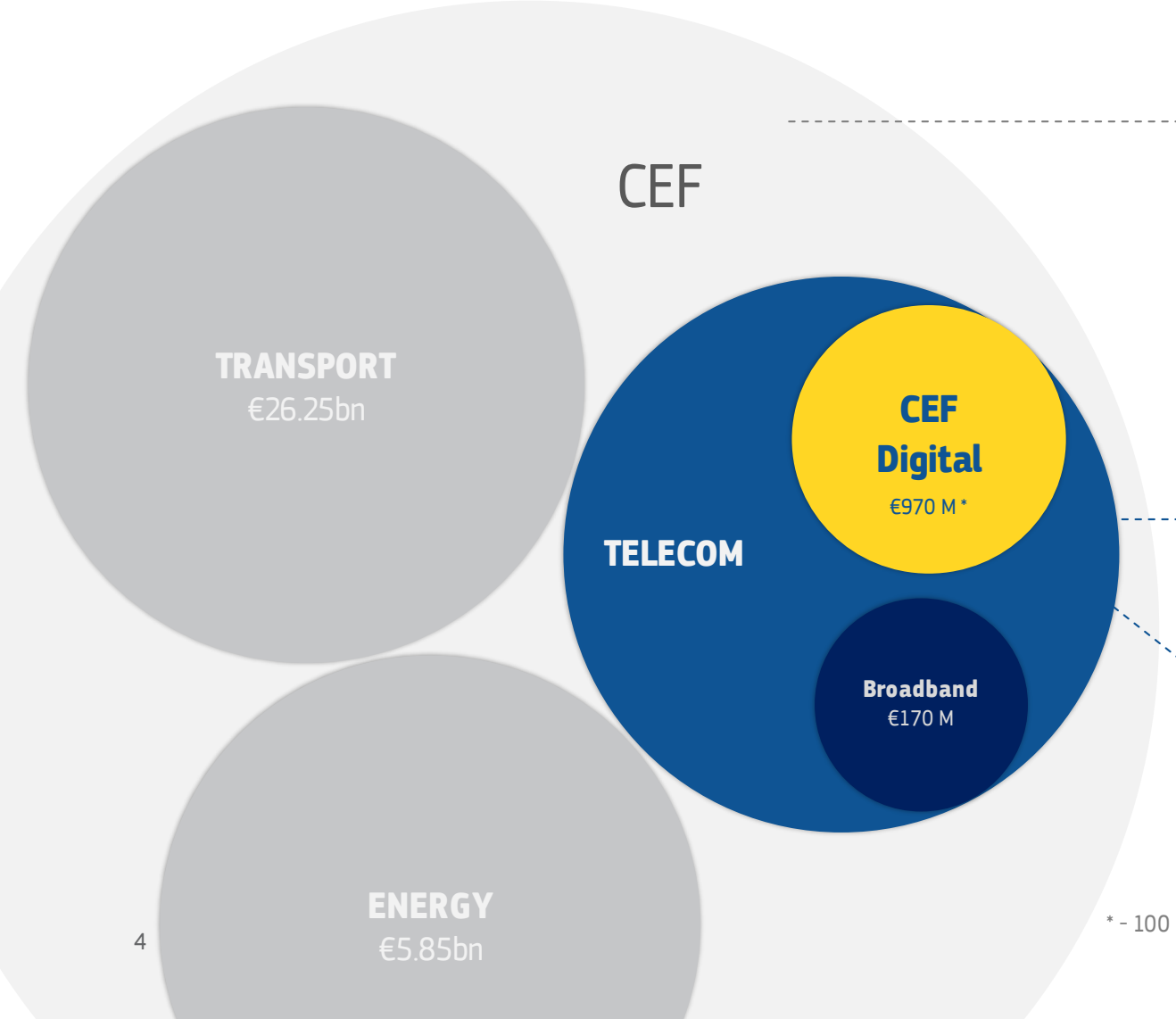
11:15 – 11:30

Q&A

Welcome to the Connecting Europe Facility (CEF) Building Blocks

Thomas Fillis
CEF Stakeholder Management Office, DIGIT

The CEF Building Blocks are funded by the Connecting Europe Facility



CEF Regulation
Defines how the Commission can finance support for the establishment of trans-European networks to reinforce an interconnected Europe.

CEF Telecom Guidelines
The CEF Telecom guidelines cover the specific objectives and priorities as well as eligibility criteria for funding of broadband networks and Digital Service Infrastructures (DSIs).

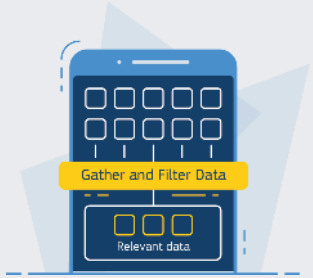
CEF Work Programmes
Translates the CEF Telecom Guidelines in general objectives and actions planned on a yearly basis.

* - 100 M Juncker Package

European Commission

Big Data Test Infrastructure

Explore and experiment with big data for improved performance and decision making



Context Broker

Analyze, manage and share data, in real time, at the right time, throughout Europe

eArchiving

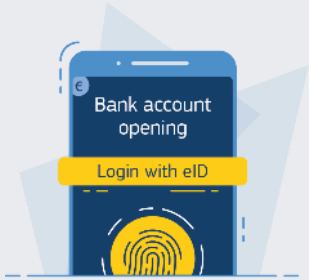
Facilitates the preservation, migration, reuse and trust of your data

European Blockchain Services Infrastructure

Harness the power of a European-wide network of blockchain services, increasing trust through data security, privacy and transparency

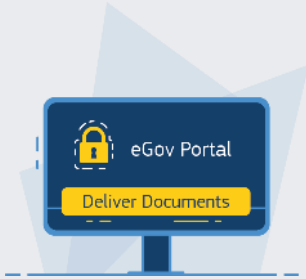
eInvoicing

Promote the implementation of the European standard for electronic invoicing across borders



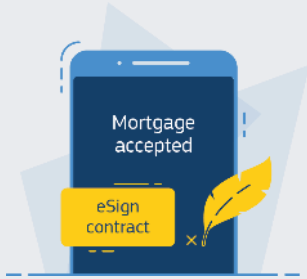
eID

Allow citizens to prove who they are across borders, making it easier to access online services in another EU Member State



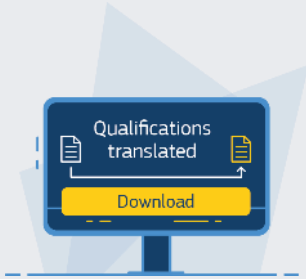
eDelivery

Exchange online data and documents reliably and securely



eSignature

Create and verify electronic signatures between businesses and EU citizens



eTranslation

Offers machine translation to translate your documents and web content into any official EU language, Norwegian or Icelandic

How does CEF support projects to use the Building Blocks?

It provides free services to help you implement them in your system. There are a range of services across the building blocks but services typically include training, sample software, testing services.

Free services

Training sessions

Sample software

Testing services

How to use a Building Block?

Build, buy or reuse the Building Blocks on your own.

Co-develop the solution or partner with other parties.

Co-develop and partner

with other parties

Build
The solution from scratch based on a European standard

Buy
A compliant solution from the market

Reuse
Sample software available on CEF website

European Standards

CEF Telecom call 2020-2: How to prepare a successful proposal

Adina Ratoi
Evaluation Manager, CEF Telecom – INEA – Unit R1

READ: all call documentation

- See **call webpage** and consult:

2020 CEF Telecom Call - eArchiving (CEF-TC-2020-2)

The **2020 CEF Telecom eArchiving call** makes an indicative **€1 million** of funding available for proposals in this area.

To get started with your application, we suggest that you consult the list of relevant documents and information for the calls as provided below:

- read the call text and Work Programme sections relevant to your call
- review the application forms, Guide for Applicants and FAQs
- consult the background documents and other relevant information

Then you can apply online using the TENtec eSubmission system.

For all questions related to the call, please check the call FAQ or contact the helpdesk (**until 15 October**).

Watch the **2020-2 CEF Telecom call virtual Info Day**

Looking for partners for your CEF Telecom consortium? Join this LinkedIn group

2020 CEF Telecom Calls

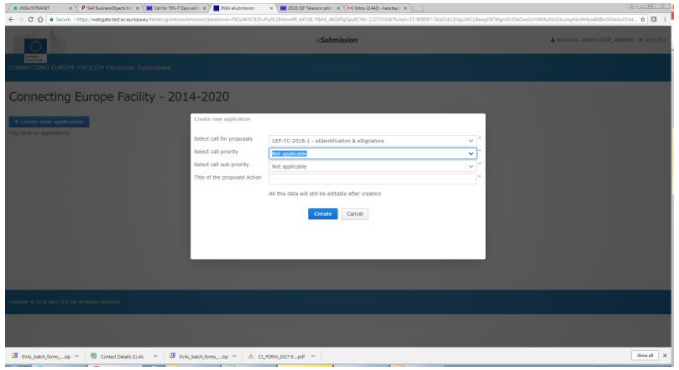
Indicative Call Timeline	
Call opening	30 June 2020
Deadline for submission	5 November 2020
Evaluation of proposals	November 2020 - January 2021
Consultation of the CEF Committee	March - April 2021
Information to the European Parliament	April 2021
Adoption of the Selection Decision	April 2021
Preparation and signature of grant agreements	Between May and August 2021

Work Programme	
EN 2019 - 2020 CEF Telecom Work Programme	Available here

Call for Proposals documents	
2020 CEF Telecom Call for Proposals – eArchiving	Call text

  - **Work Programme (Annex)**
  - **Call text**
    - Take special note of the Priorities & Objectives (section 2.1) and Results (section 2.2) which provide specific information on what is expected from the proposals to achieve
    - Carefully read the Award Criteria (section 9) which explain how the proposal will be evaluated
  - **Application forms** – you must use the templates provided!
  - **Guide for Applicants**
  - **FAQs** – both general & specific
  - **Model grant agreement**

READ: how to use TENtec



- **TENtec:** system used to manage the CEF projects during their entire lifecycle and which enables the electronic submission of proposals under the CEF calls
- Step-by-step instructions for the **TENtec eSubmission system** in the Guide for Applicants

NEW!

New feature: if you encode an activity start date in the past or an activity end date before the results of the evaluation will see a **warning**

READ: Application forms

All application forms and access to TENtec eSubmission module available via call page on INEA website

Application Forms

Part A

Main characteristics of the proposal

(applicants, work-plan, budget)

Part B

Administrative information (exclusion grounds)

Part C

Information on compliance with EU law

Part D

Technical and financial information

Application form A

Essential information **on the applicants** and **on the proposal:** summary of the action, timing, activities and milestones, budget, breakdown of eligible costs and requested funding plus Member State approval

- **MUST** be encoded in the TENtec eSubmission module, .pdf will be generated automatically (Word version provided for reference on call webpage)
- Includes forms that require signature of the applicants (A2.2) and Member State validation (A2.3) – **upload separately**

The descriptions of the proposed Action and activities will also be used for the grant agreement preparation: be complete, informative and precise!

Application form B

Administrative information on applicants to demonstrate compliance with **operational capacity** (*required by EU Financial Regulation)*

- Capacity of applicant to complete the proposed Action - complements information from application form part D2.3 (e.g. *activity reports, CVs, reports on similar projects, etc.)*
- **Certain types of applicants DO NOT** need to demonstrate operational capacity

NEW!

Each applicant should **register** in the **Participant Register** before the call deadline and enter the **PIC number** in **Application Form Part A**.

Complete all relevant parts of form B and upload to TENtec.

Application form C

- **Information on compliance with EU law on public procurement**

- **Information on other sources of EU financing** that may be received by the proposal (cannot receive grants from two EU funding sources)

Application form D

Detailed technical information describing the proposed Action

- **You must use the template available on the call page!**
- Order of the sections to be filled in reflects the **award criteria**
  - **Address each point and subpoint in your application to ensure that your proposal contains all of the relevant information on which it will be assessed**
- Part D: **30 pages** maximum

- Add **Gantt chart + other annexes**: please ensure that these are **readable and useful** for the evaluators!

Award criteria

- **Defined in the Work Programme and call text**
  - Did you understand the priorities, objectives and expected results defined in the call texts?
  - Does your proposed Action address these points?
  - Can you justify why YOUR proposal should ultimately be selected for funding?

Relevance	Quality & efficiency of implementation	Impact & sustainability
• Alignment to DSI implementation objectives & activities (WP) • Alignment to EU/national policies, strategies and activities	• Maturity • Coherence/effectiveness with work plan • Quality of consortium/consortium members • Support from national authorities/industry/NGOs • Attention to security/privacy/ inclusiveness/accessibility	• Quality of the approach to facilitate wider deployment/take-up of the proposed actions • Capability of long-term sustainability without EU funding

Consortium & approval requirements

- **Check the consortium requirements/requirements on types of applicants**
  - Do you have enough partners lined up to participate?
  - Who will serve as the consortium coordinator?
  - Does this organisation understand its role as a coordinator?
  - Can you provide evidence/justify that all applicants in the proposal meet the eligibility criteria?

- **Member State approval is necessary for all applicants and all applications to be eligible**
  - Do you understand how this approval process is done in your Member State?
  - Have you taken into consideration the time it will take to obtain the approval(s)?

Consider…

- **Showing concrete evidence on how your proposed Action**
  - supports the objectives of the call
  - addresses the award criteria
  - mitigates any possible identified risks
  - incorporates a clear timetable and planning overview

- **Providing explanations/diagrams of IT solutions used, architecture, standards, etc.**
  - explain the work you will be undertaking
  - provide ample descriptions of your activities and milestones

- **Justifying costs (personnel, subcontracting, other costs)**

- **Including a business plan for sustainability**

A good proposal…

- uses simple language
- provides clear descriptions on how the proposed activities/tasks will be implemented
- addresses **all** of the award criteria in sufficient detail
- is well-structured

Evaluators must find the relevant information and evidence in the proposal in order to evaluate it – they will not make any assumptions!

REMEMBER: time flies…

- **Start NOW and don't forget about the deadline**
  - Completing an application is time consuming, especially for first time applicants
  - Member State endorsement and multi-applicant proposals take time
  - If the deadline passes and you haven't submitted your complete proposal, it will be declared inadmissible: it will not be evaluated!

Answering your questions - FAQs

- **Helpdesk:** INEA-CEF-Telecom-calls@ec.europa.eu
  - **General FAQs and specific FAQs**
  - **Deadline to submit questions: 15 October 2020**
  - **Deadline to publish answers: 29 October 2020**
- Questions on **TENtec eSubmission module?** Responses will be provided until the deadline
- **Visit your call webpage regularly to check for updates, sign up for our Twitter feed and FAQ notifications**

One last step: make a final check before submitting your application

- Follow the steps as detailed in the Guide for Applicants
- Use the **checklist** to ensure that you have all necessary forms
- Upload **all** forms requiring signatures + make them clearly identifiable by their file name in English
- Do not forget any supporting documents
- Keep your originals – they may be requested later

- Submit in TENtec **before the deadline 5 November 2020**(**do not wait until the last minute!)**

European Commission

CEF Telecom calls: for more information

inea-cef-telecom-calls@ec.europa.eu

https://ec.europa.eu/inea/en/connecting-europe-facility/cef-telecom/apply-funding/2020-cef-telecom-calls-proposals

@inea_eu

Thank you!

Innovation and Networks Executive Agency

DBPTK – an eArchiving solution for database archiving

Luis Faria
Research & Innovation Director – KEEP SOLUTIONS

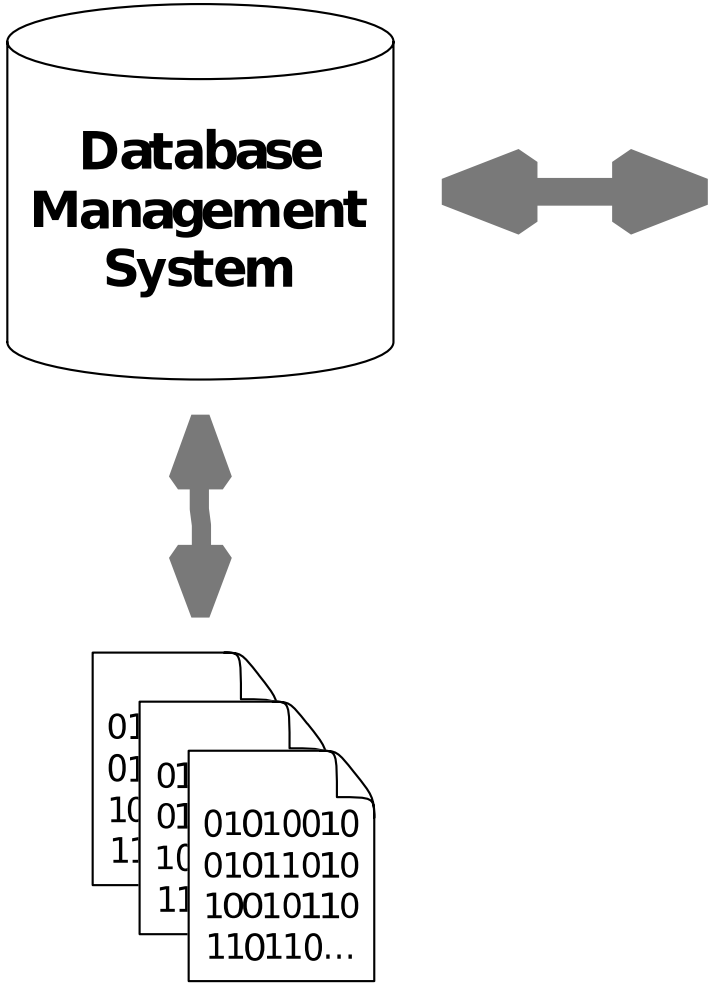
Databases

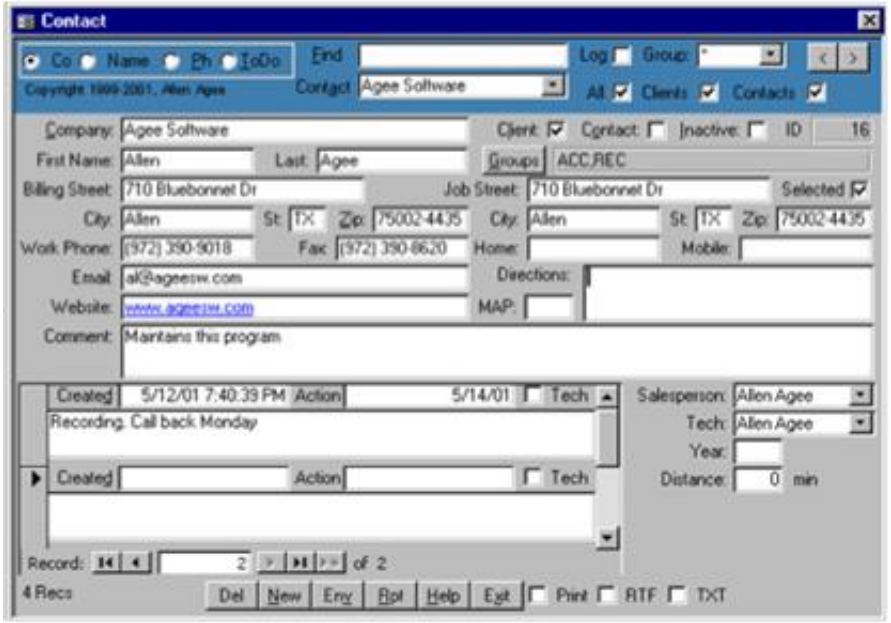
The **information** that supports institutions and businesses is usually **centralized on databases**.

This information is of **great value** and needs to be **preserved for decades** due to strategic and legal reasons.

The systems that have this information are usually complex with **many software components** playing their part for supporting the **business-logic**, and the **submission** and **presentation** interfaces.

The information is usually laid out in an **organization specifically optimized for the database** and original business objectives, i.e. **not in a user-friendly** organization.





Application

Cell

person			
id	**name**	**birth**	**city_id**
1	Mary	1986-03-28	2
2	Phillip	1974-11-08	3
3	Alison	1991-06-10	5
4	Barry	1979-09-14	2

Row

Column

person			
id	**name**	**birth**	**city_id**
1	Mary	1986-03-28	5
2	Phillip	*NULL*	6

city			
id	**name**	**mayor**	**country_id**
5	Payne Springs	1	16
6	Rosenhayn	*NULL*	16

country	
id	**name**
16	United States

Information to preserve

Within the relational database:

- Information in tables
- Column data types
- Relations and constraints
- Projections (views)
- Behaviour (triggers and routines)
- Other (users, permissions, etc.)

Outside the relational database:

- External resources
  (e.g. files in filesystem)
- Submission forms
- Presentation interfaces
- Application logic and queries

Preservation strategies

- Hardware and software museums
- Emulation
- File format migration
- Encapsulation

Hardware and software museums

Preserve the **whole technology stack** needed to render the original content.

⊕ reproduction accuracy	⊖ great difficulty to maintain
	⊖ restrictions on the access to information
	⊖ need for users to understand how to operate long gone systems

Emulation

Use of a software system that **emulates the behaviour** of an older hardware and/or software platform within a newer one.

⊕ reproduction accuracy	⊖ difficult to maintain
⊕ no need to maintain hardware	⊖ difficult to set up
	⊖ need for users to understand how to operate long gone systems

File format migration

Transfer of digital information from one hardware and software configuration into another.

Convert information encoded in a file format, tied into an **obsolete technology stack**, into another **more current or better suited for long term preservation**.

⊕ easier to use and reuse information	⊖ possible data loss during conversion (can be mitigated by quality assurance)
⊕ no need to maintain hardware	⊖ might need to migrate again in the future
⊕ no need to maintain software	

Encapsulation

Keep files together with all necessary documentation needed for future development of emulators, file format migrators or software renderers.

⊕ postpone actions that can be costly	⊖ may hinder timely access to information
⊕ no need to maintain hardware or software	⊖ difficult to gather documentation of complex or closed file formats
	⊖ difficult to ensure quality and completeness without hindsight

The problem with preserving databases

- Every vendor has his data types and export formats
- It is rare that information exported from one vendor’s system works on another
- Sometimes doesn’t work on different versions of the same product
- Need for a vendor-agnostic format based on standards

Preservation format criteria

Ubiquity	Stability	Complexity
Support	Ease of identification and validation	Interoperability
Disclosure	Intellectual Property Rights	Viability
Documentation quality	Metadata support	Re-usability

https://www.nationalarchives.gov.uk/documents/selecting-file-formats.pdf

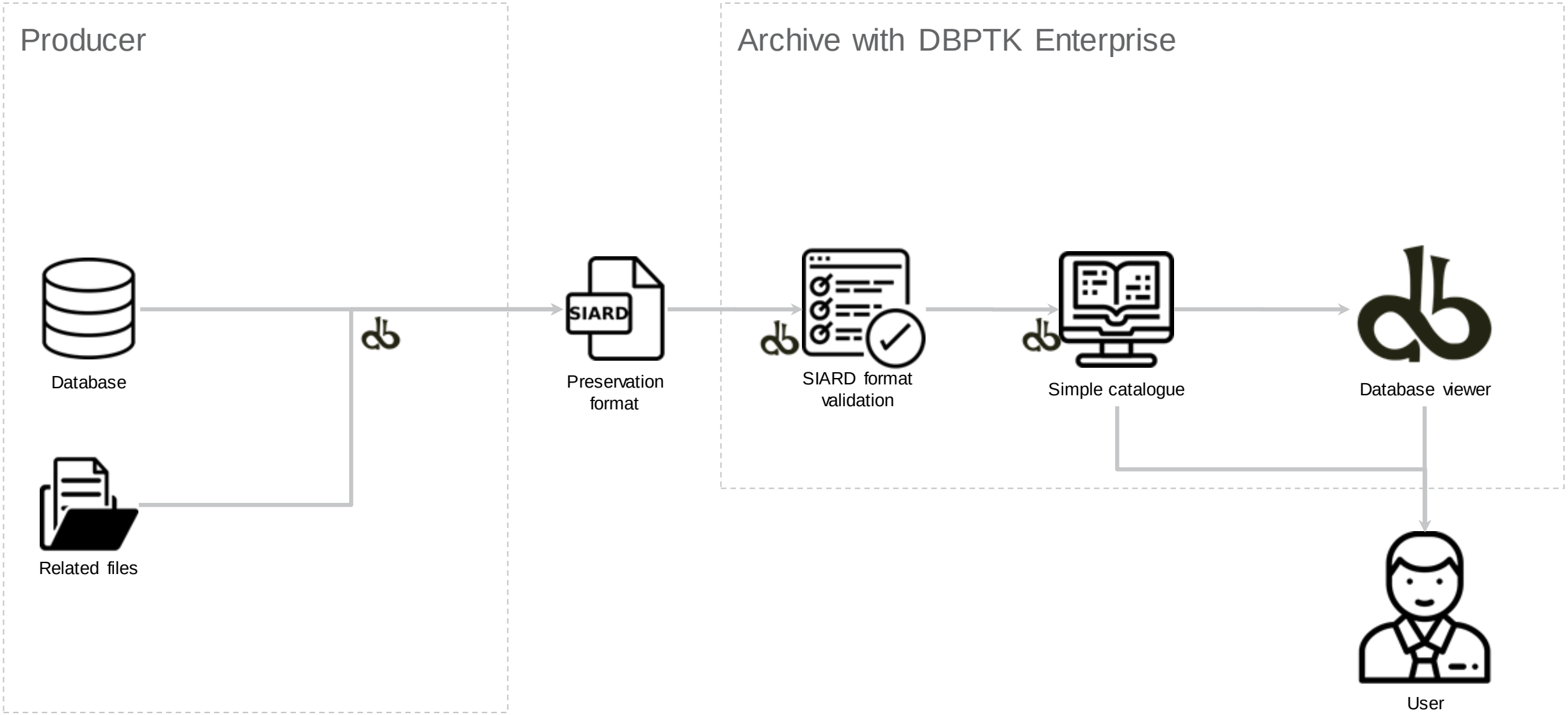
SIARD: Software Independent Archiving of Relational Databases

- Database preservation format
- Based on international standards
- For database data, structure and behaviour
- Swiss national standard eCH-0165
- Now managed by DILCIS board and the EU eArchiving building block

https://dilcis.eu/content-types/siard

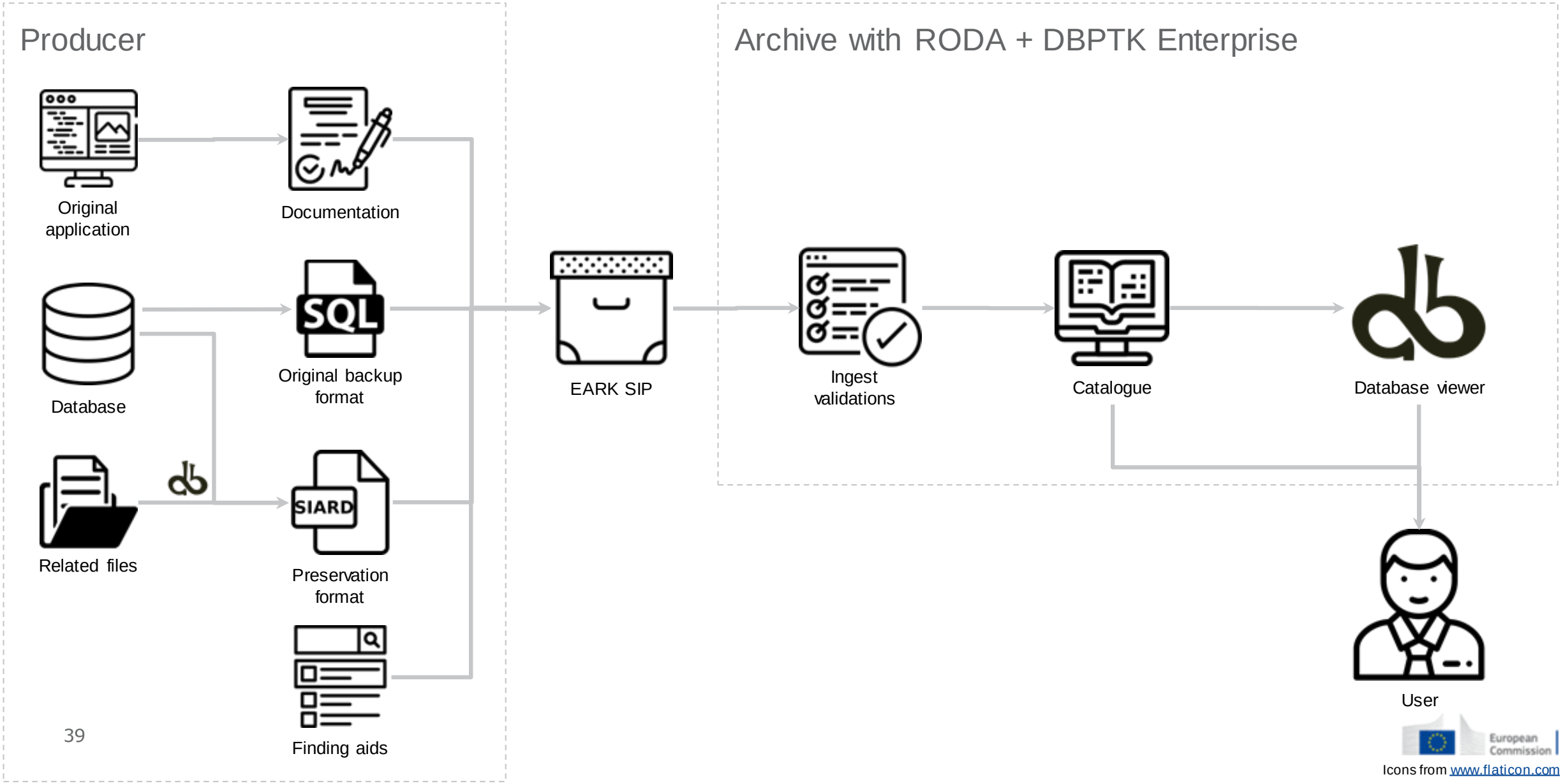
https://ec.europa.eu/cefdigital/wiki/display/CEFDIGITAL/eArchiving

Simple database archive flow



Icons from www.flaticon.com

Full database archival flow



Icons from www.flaticon.com

DBPTK
Database Preservation Toolkit

Set of tools to store relational databases in a standard archival format.

https://database-preservation.com

DBPTK Desktop
Desktop application to save database to preservation format, validate it, and browse and search the content

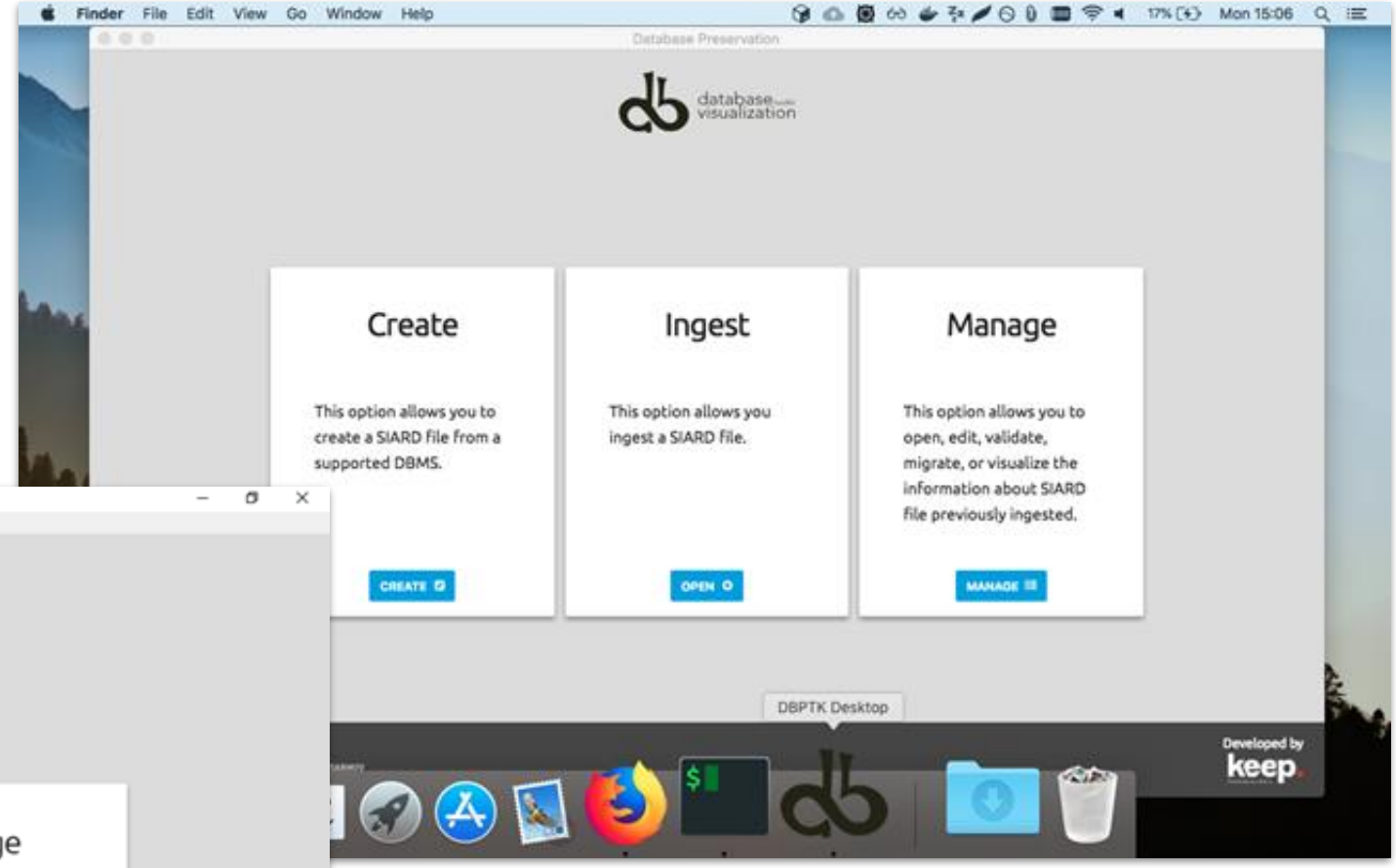
DBPTK Enterprise
Web application to browse and search on the content of multiple large preserved databases

DBPTK Developer
A command-line tool and development library for automation and system integration

DBPTK Desktop

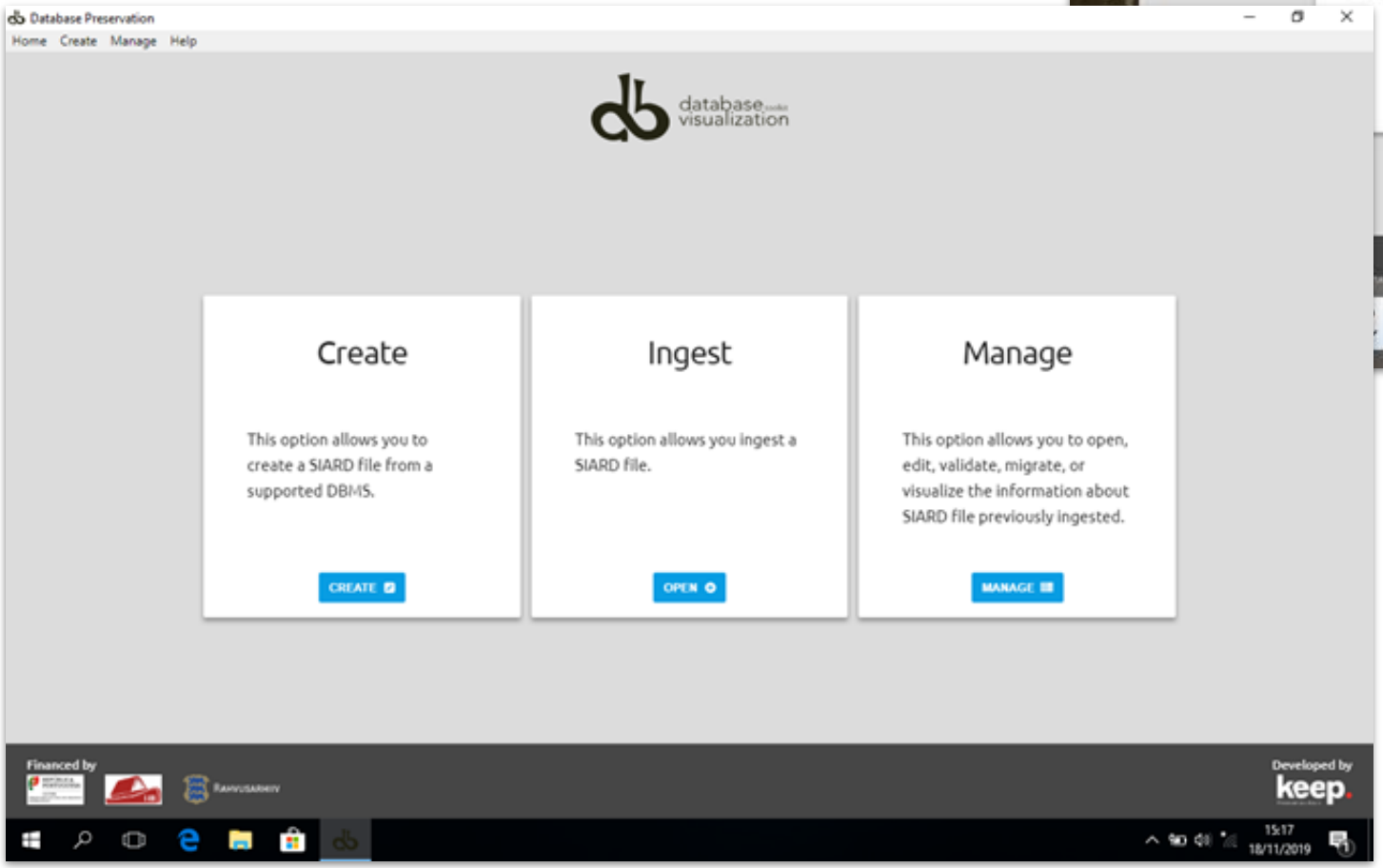
Basic features

DBPTK Desktop features



macOS

Windows



Also available on Linux

European Commission

DBPTK Desktop features

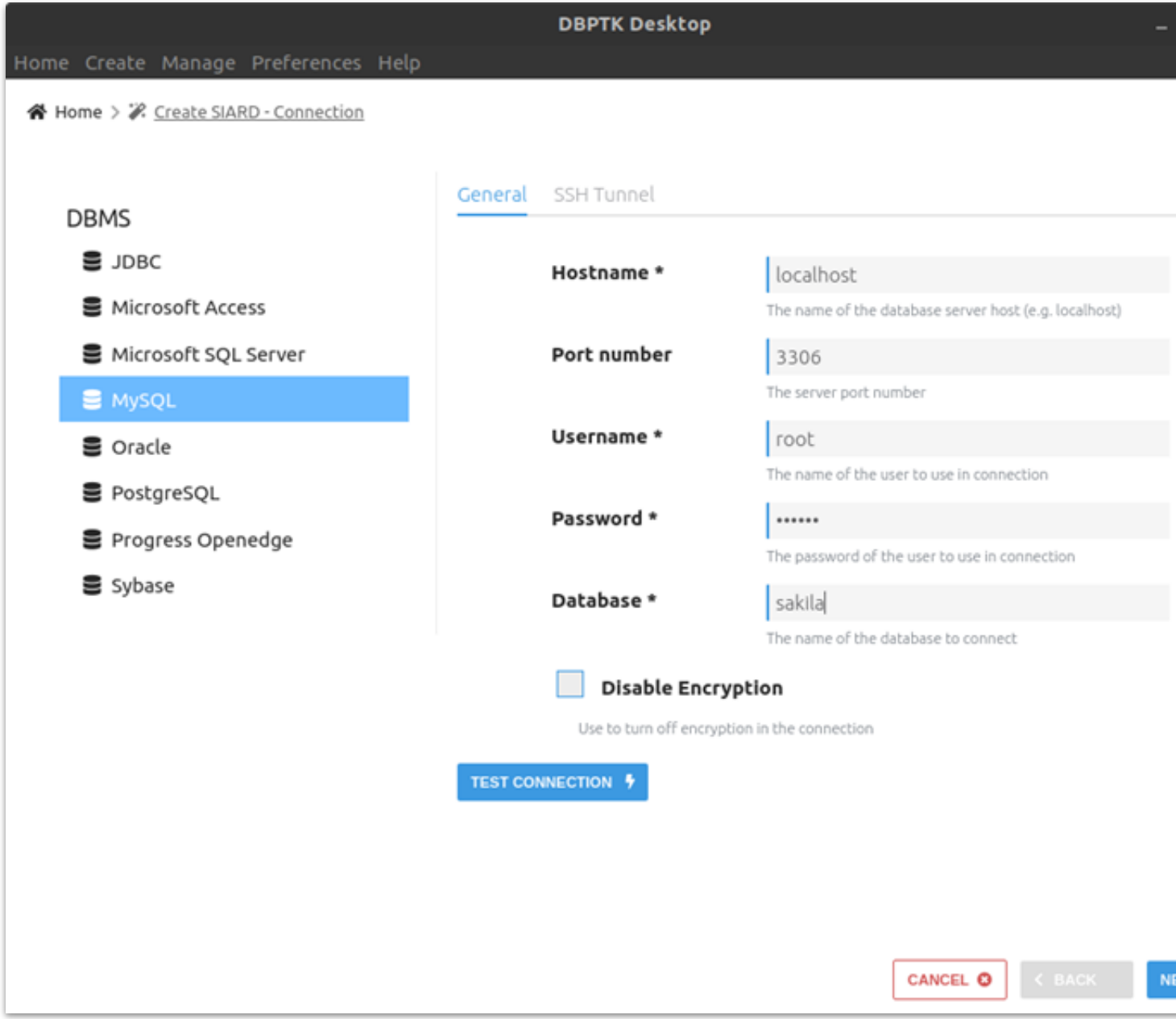
SIARD creation

Export database to a preservation format

- Connect to a local or remote database and save all content into a preservation format like SIARD
- Test connection will diagnose most common problems and provide you with helpful hints to solve them

Supported DBMS:

- Microsoft Access
- Microsoft SQL Server
- MySQL / MariaDB
- Oracle
- PostgreSQL
- Progress Openedge
- Sybase



DBPTK Desktop features

Migration report
Detailed report of migration changes and losses

- All export and selection parameters are presented.
- All column data types mapping to standard types are recorded.
- All compromises are documented.

Database Preservation Toolkit (version 2.8.2) – Conversion Report

Parameters

Import module: mysql

- hostname = dpc.database-preservation.com
- database = sakila
- username = mguimaraes
- password =
- port-number = 3306
- disable-encryption = false

Export module: siard-2

- version = V2_1
- file = /home/mguimaraes/Desktop/sakila-dpc.siard
- compress = true
- pretty-xml = false
- external-lobs = false
- external-lobs-per-folder = 1000
- external-lobs-folder-size = 0
- digest = SHA-256
- font-case = lowercase

Date: 2020-07-22

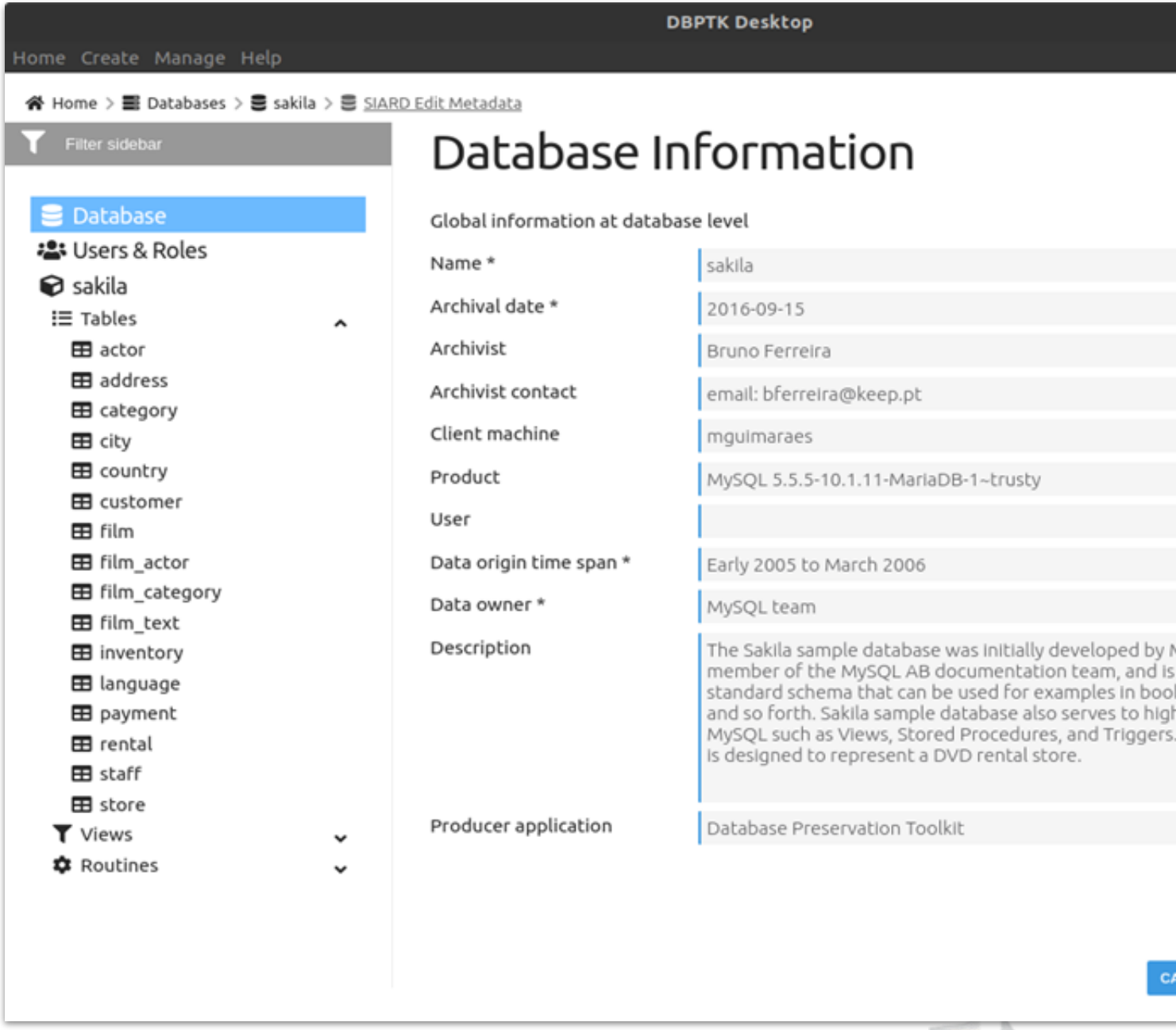
Details

- Type conversion in import module: in `sakila.address.address` (format: schema.table.column) has original type `VARCHAR` and was converted to the standard type `CHARACTER VARYING(50)`
- Type conversion in import module: in `sakila.address.district` (format: schema.table.column) has original type `VARCHAR` and was converted to the standard type `CHARACTER VARYING(20)`
- Type conversion in import module: in `sakila.city.city` (format: schema.table.column) has original type `VARCHAR` and was converted to the standard type `CHARACTER VARYING(50)`
- Type conversion in import module: in `sakila.country.country` (format: schema.table.column) has original type `VARCHAR` and was converted to the standard type `CHARACTER VARYING(50)`
- Type conversion in import module: in `sakila.actor.actor_id` (format: schema.table.column) has original type `SMALLINT UNSIGNED` and was converted to the standard type `SMALLINT`
- Type conversion in import module: in `sakila.actor.first_name` (format: schema.table.column) has original type `VARCHAR` and was converted to the standard type `CHARACTER VARYING(45)`
- Type conversion in import module: in `sakila.actor.last_name` (format: schema.table.column) has original type `VARCHAR` and was converted to the standard type `CHARACTER VARYING(45)`
- Information: check constraints is not yet supported for MySQL. But support may be added in the future
- Type conversion in import module: in `sakila.address.address_id` (format: schema.table.column) has original type `SMALLINT UNSIGNED` and was converted to the standard type `SMALLINT`
- Type conversion in import module: in `sakila.address.address` (format: schema.table.column) has original type `VARCHAR` and was converted to the standard type `CHARACTER VARYING(50)`
- Type conversion in import module: in `sakila.address.address2` (format: schema.table.column) has original type `VARCHAR` and was converted to the standard type `CHARACTER VARYING(50)`
- Type conversion in import module: in `sakila.address.district` (format: schema.table.column) has original type `VARCHAR` and was converted to the standard type `CHARACTER VARYING(20)`
- Type conversion in import module: in `sakila.address.city_id` (format: schema.table.column) has original type `SMALLINT UNSIGNED` and was converted to the standard type `SMALLINT`
- Type conversion in import module: in `sakila.address.postal_code` (format: schema.table.column) has original type `VARCHAR` and was converted to the standard type `CHARACTER VARYING(10)`

DBPTK Desktop features

Edit SIARD metadata
Enrich archived database with descriptions

- Add descriptions to database, tables and columns to better understand its contents

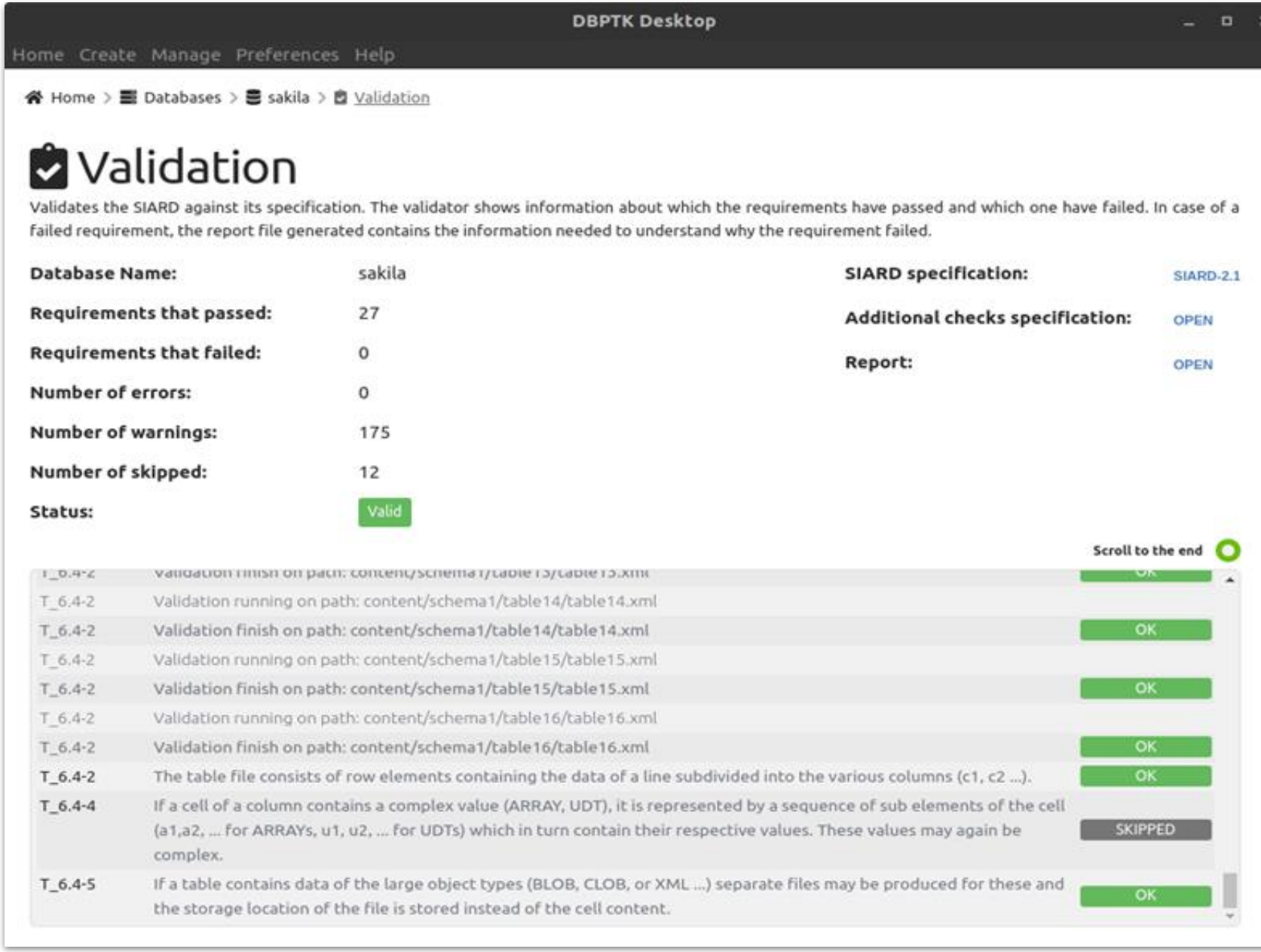


DBPTK Desktop features

SIARD validation

Validate archived database

- Validate SIARD against specification plus many additional checks for a thorough validation

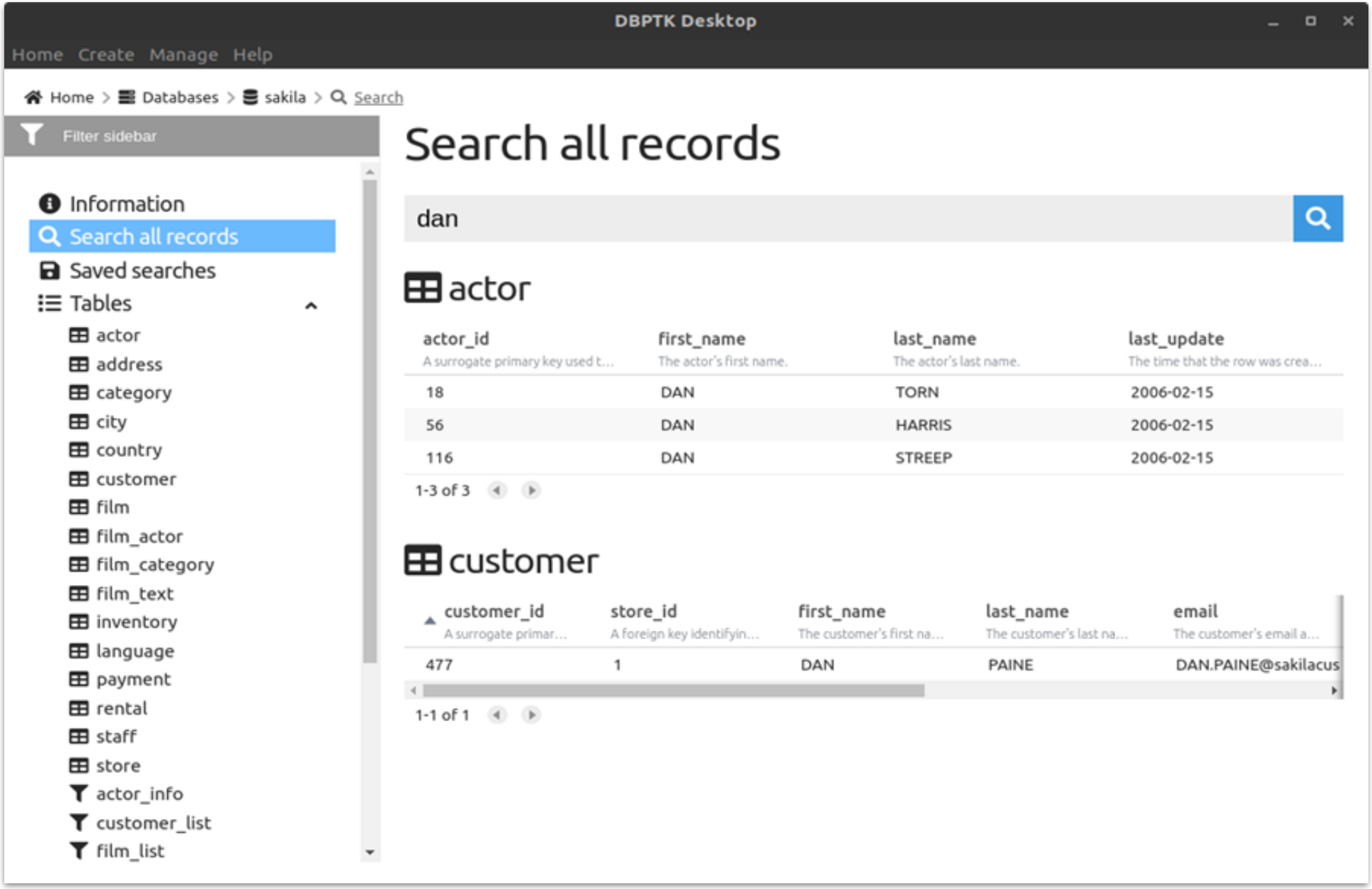


DBPTK Desktop features

Search records

Browse and search database content

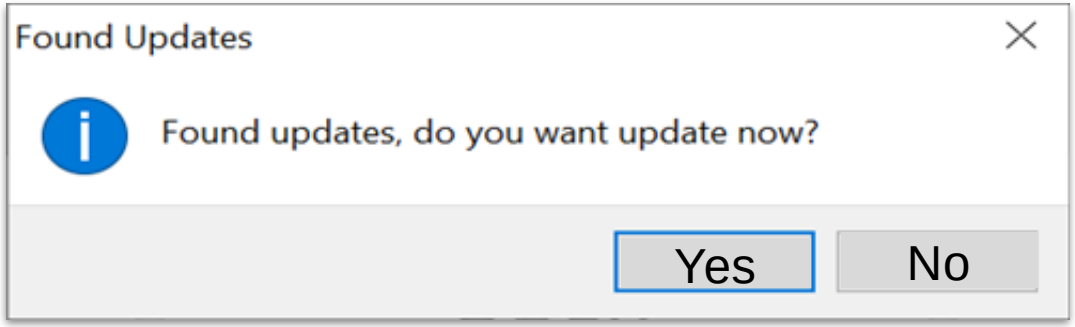
- Google-like search on the database content.
- Drill down on specific tables and do advanced search for specific fields to find exactly what you are looking for.

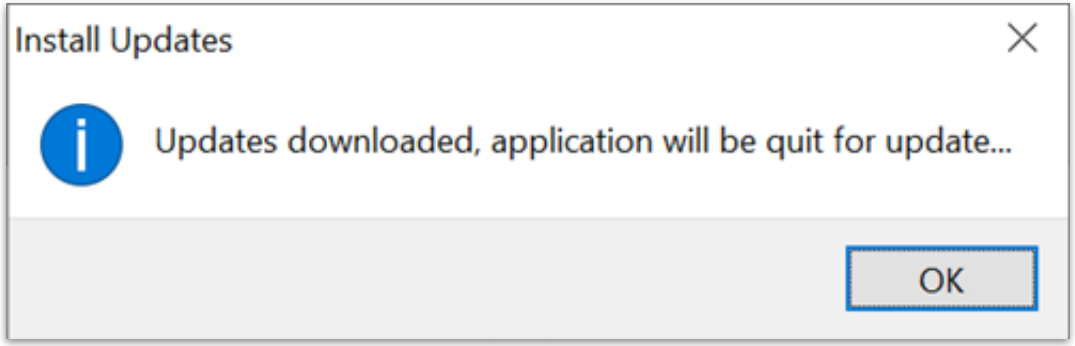


DBPTK Desktop features

Auto-update
Automatic check of updates

- Stay up-to-date with automatic update check on startup and installation of new versions.





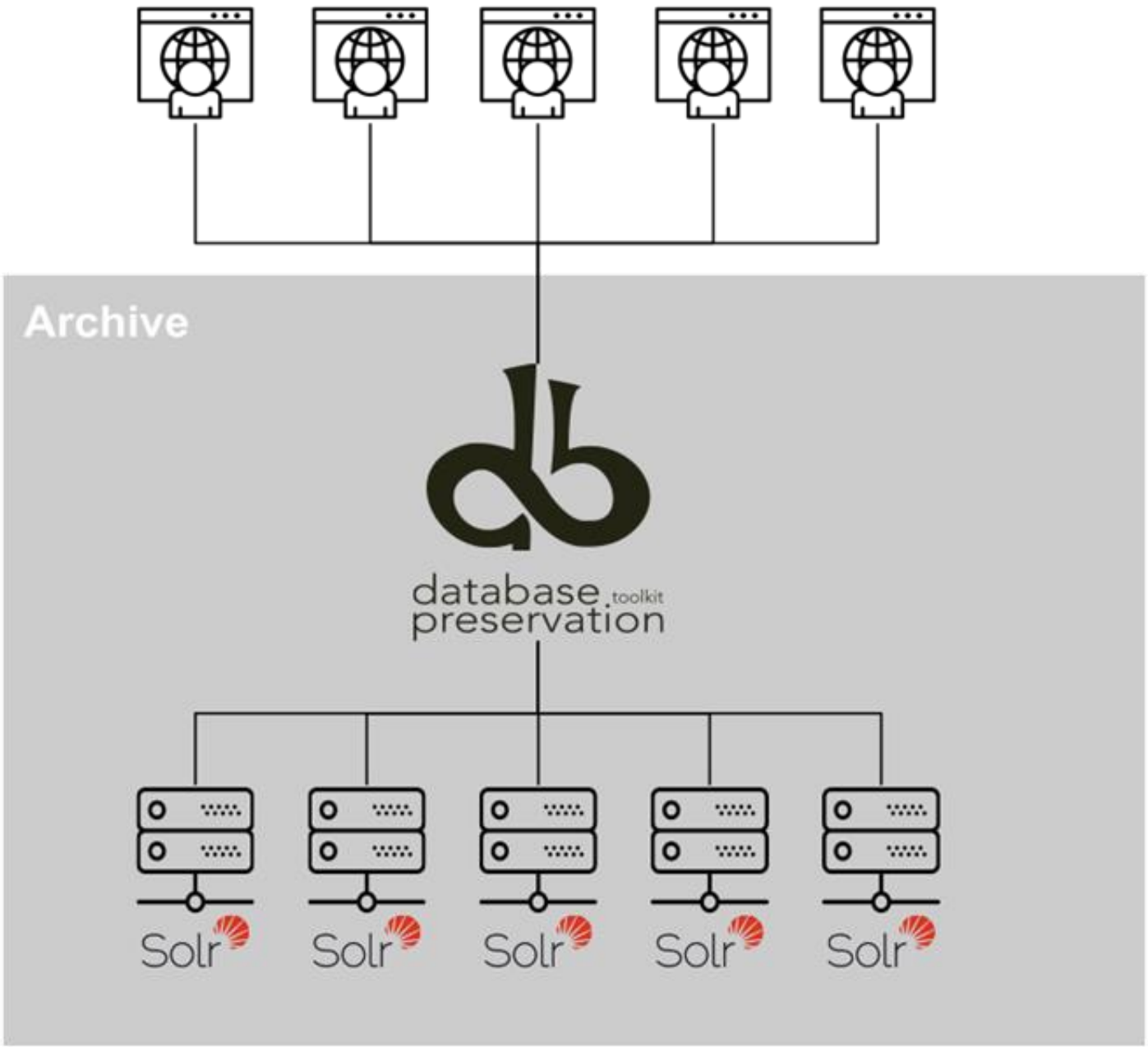
DBPTK Enterprise

Basic features

DBTPK Enterprise features

Enterprise architecture
For large institutions with many databases and users

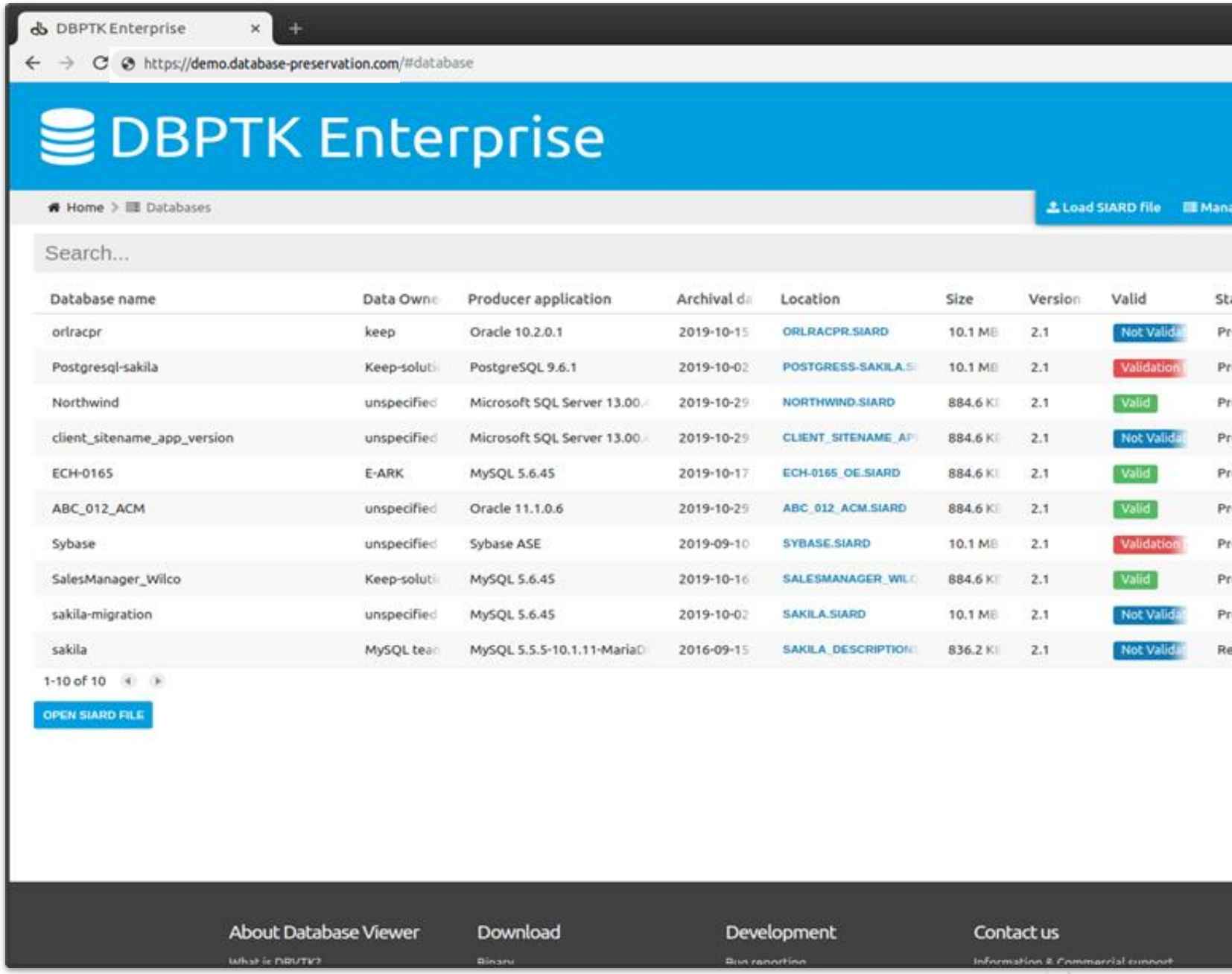
- A web application that can be horizontally scaled to support many very large databases being accessed by many users



DBTPK Enterprise features

Manage multiple databases
Single system, multiple databases

- Search through the databases, manage their status, enrich their metadata, validate them, make them ready for users to search.



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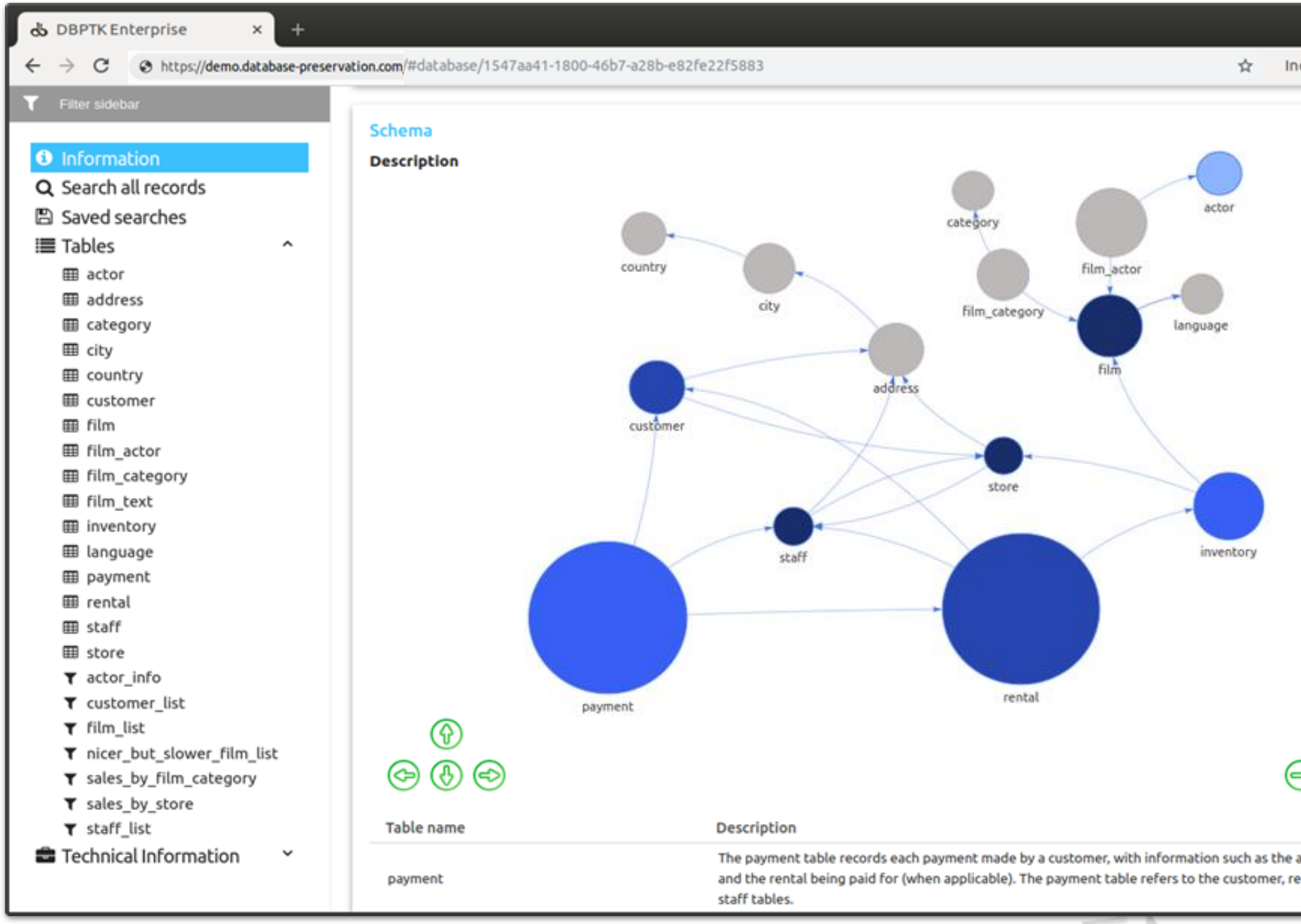
DBTPK Enterprise features

Data transformation
Transform content to answer useful questions

- **De-normalization** and table and **column hiding**, to simplify browsing and allow **anonymization** of content



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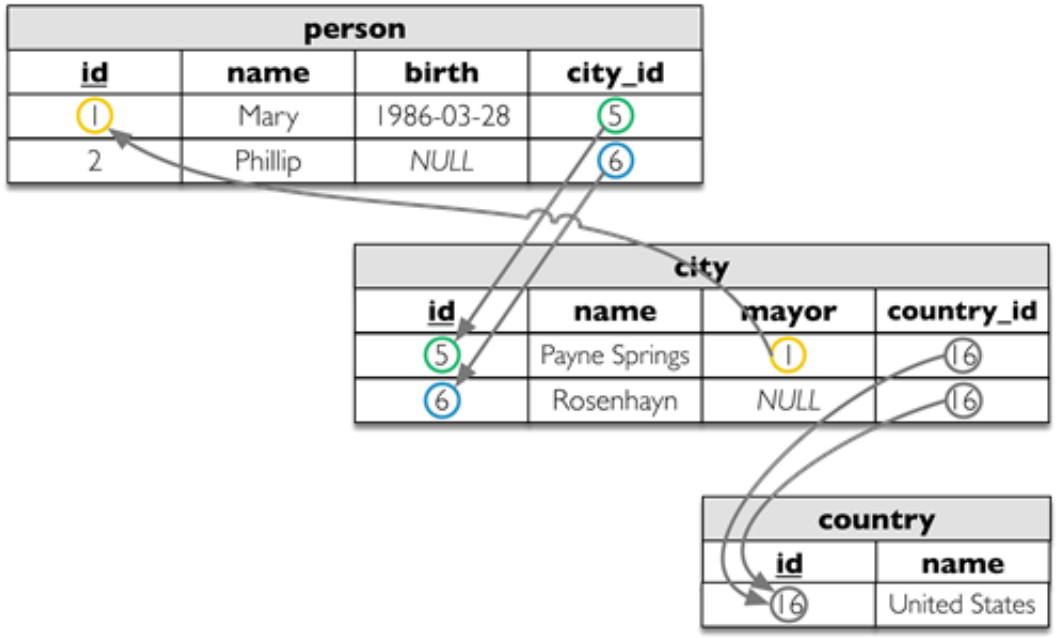
Data transformation (aka denormalization)

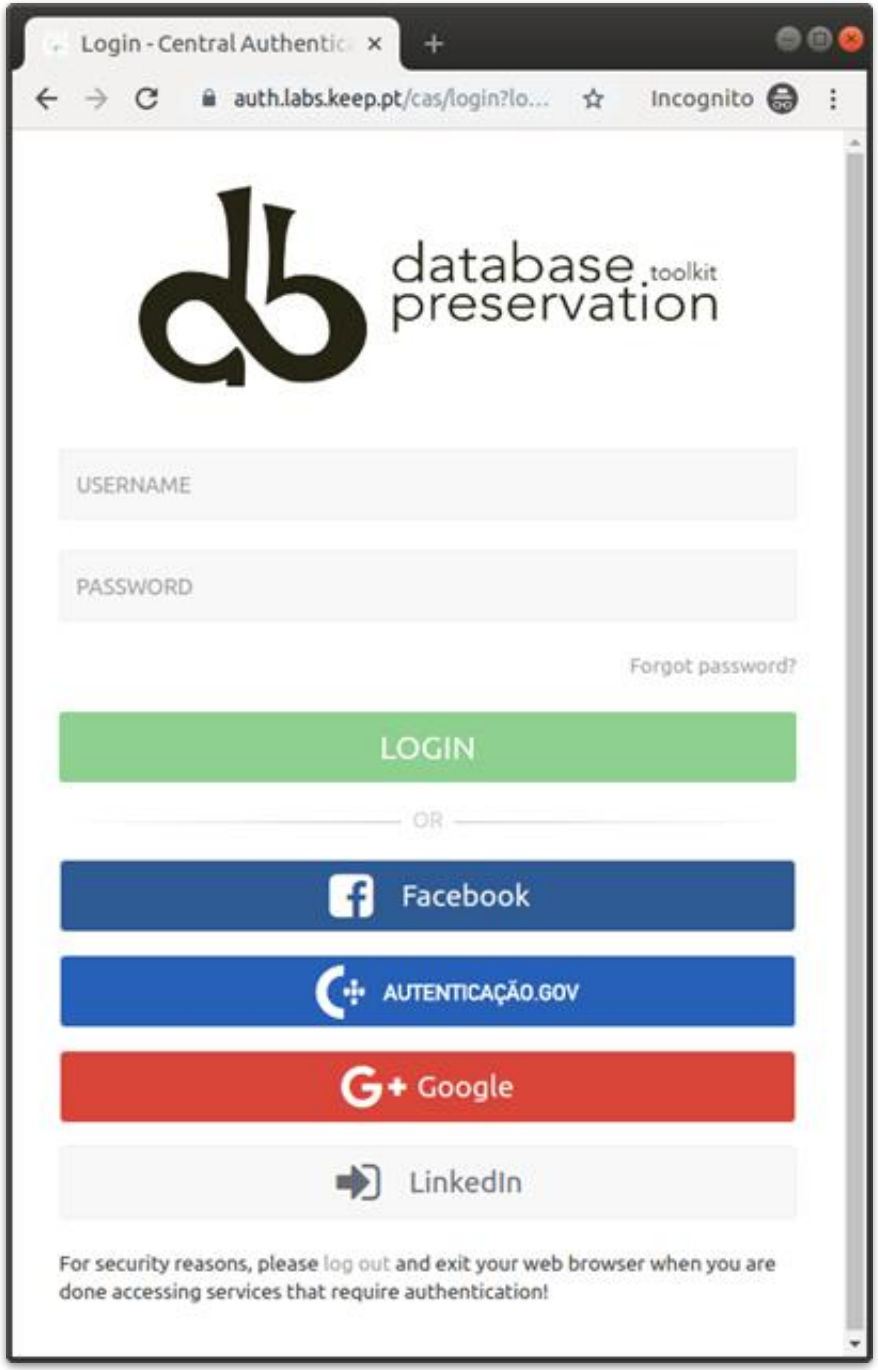


person				
Name	Birth	City name	Mayor	Country name
Mary	1986-03-28	Payne Springs	Mary	United States
Phillip		Rosenhayn		United States

DBPTK Enterprise features

Single sign-on
Support for multiple protocols

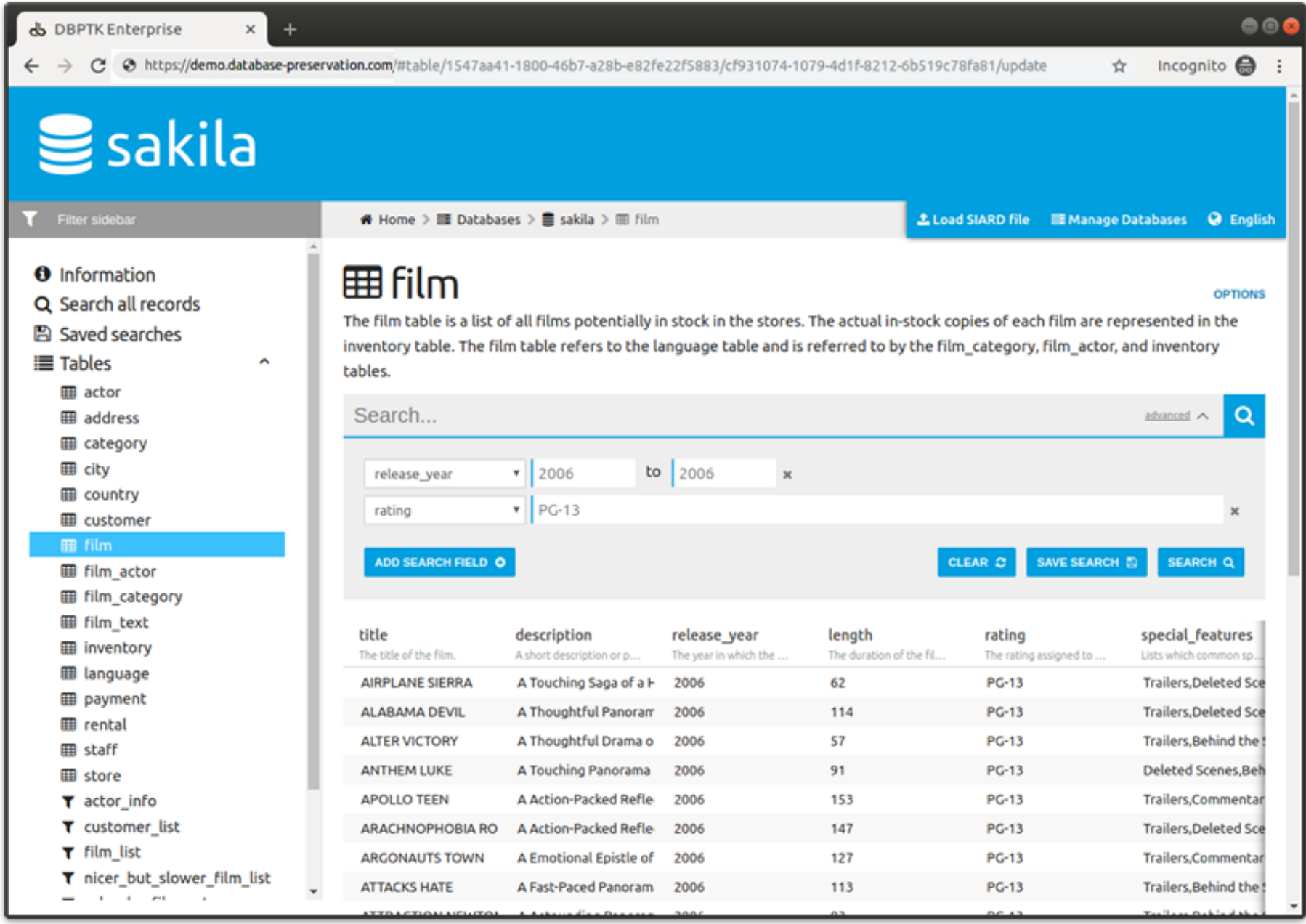
- LDAP, Active Directory, Database, SAML, ADFS, OAuth2, OpenID, Google, Facebook, Twitter, FIDO U2F, YubiKey, Google Authenticator, Authy, etc.
- Supports internal authorization definition or configurable external authorization



DBPTK Enterprise features

Browse and search
Allow users to access database content on the Web

- Allow them to search on a prepared, user-friendly and anonymized database content



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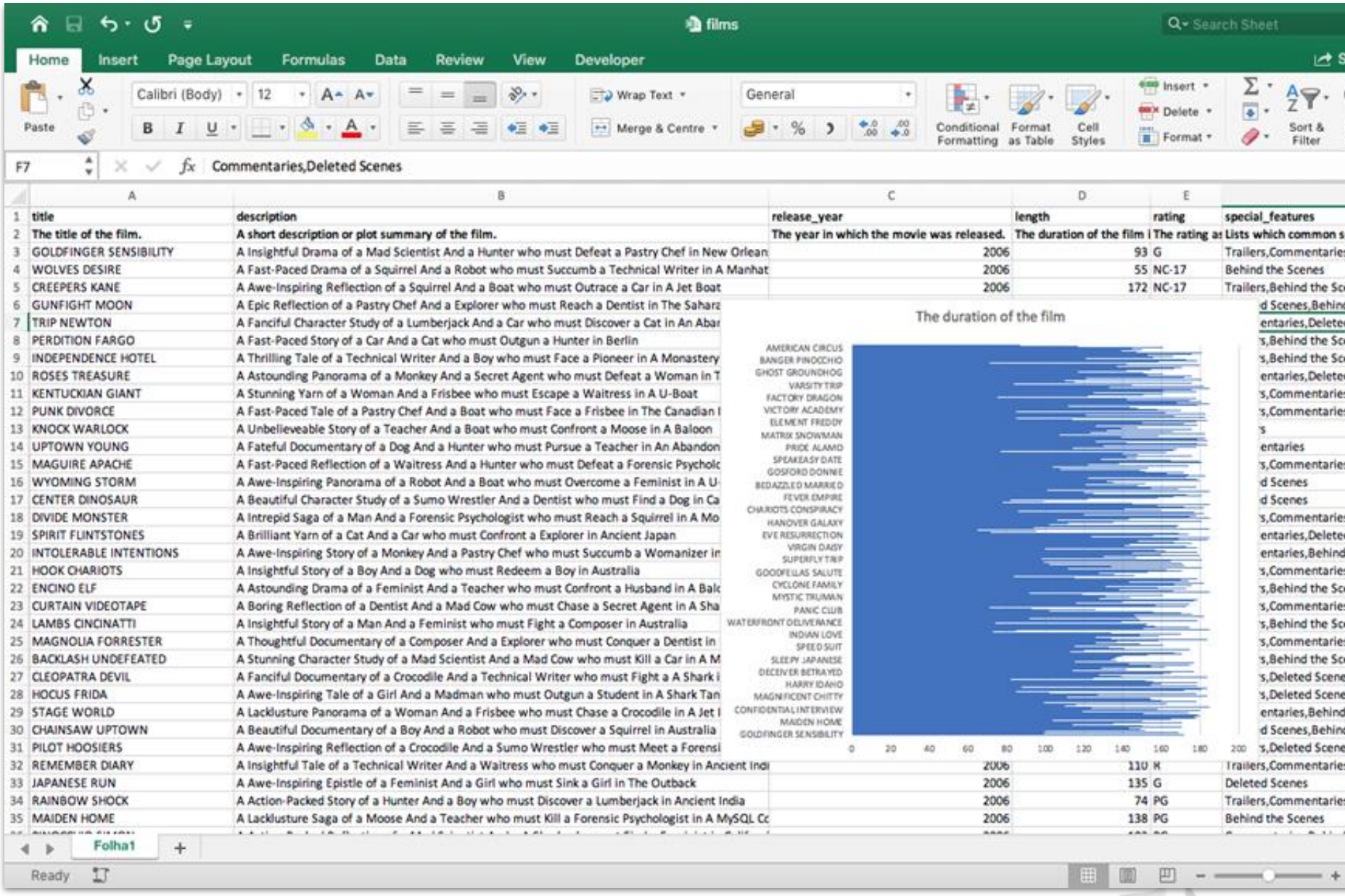
DBPTK Enterprise features

Export features

Export data into tabular data

- Allow users to save search results in Microsoft Excel or other spreadsheet software format for easy analytics and diagrams



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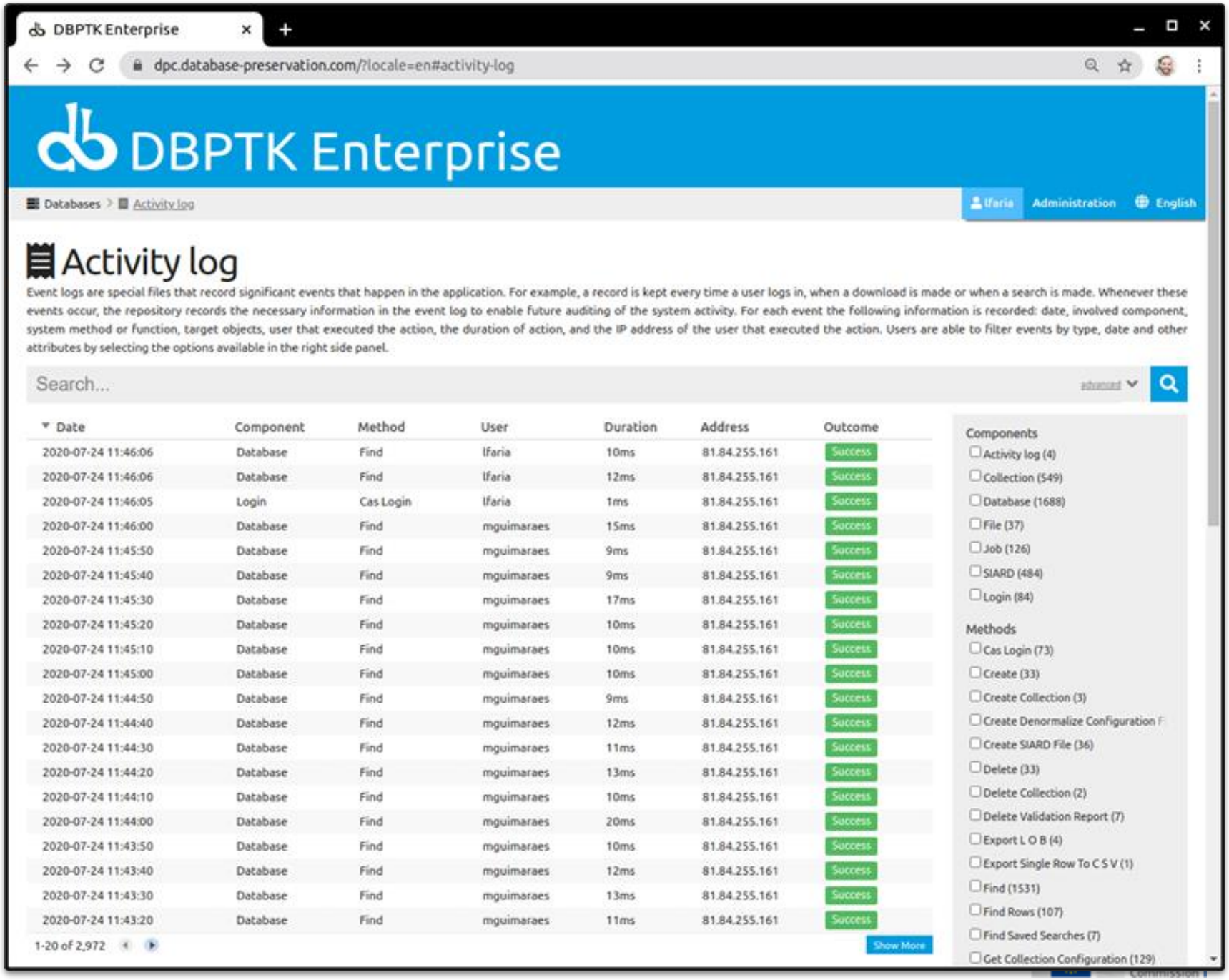
DBPTK Enterprise features

Activity log

Audit every access

- Who has done what, when and from where.
- Requirement for ISO 16363 certification.



DBPTK Enterprise & Desktop

Multiple languages supported

Interface translated into:

English, German, Estonian, Czech, Portuguese

Search stemming and stopwords support for:

English, Arabic, Bulgarian, Catalan, Czech, Danish, German, Greek, Spanish, Estonian, Basque, Persian, Finnish, French, Irish, Galician, Hindi, Hungarian, Armenian, Indonesian, Italian, Latvian, Dutch, Norwegian, Portuguese, Romanian, Russian, Swedish, Thai, Turkish, Japanese (using morphological analysis), CJK bigram (Chinese, Japanese, and Korean languages)

DBPTK Developer

Basic features

DBPTK Developer features

Command line interface

Automation of periodic preservation tasks

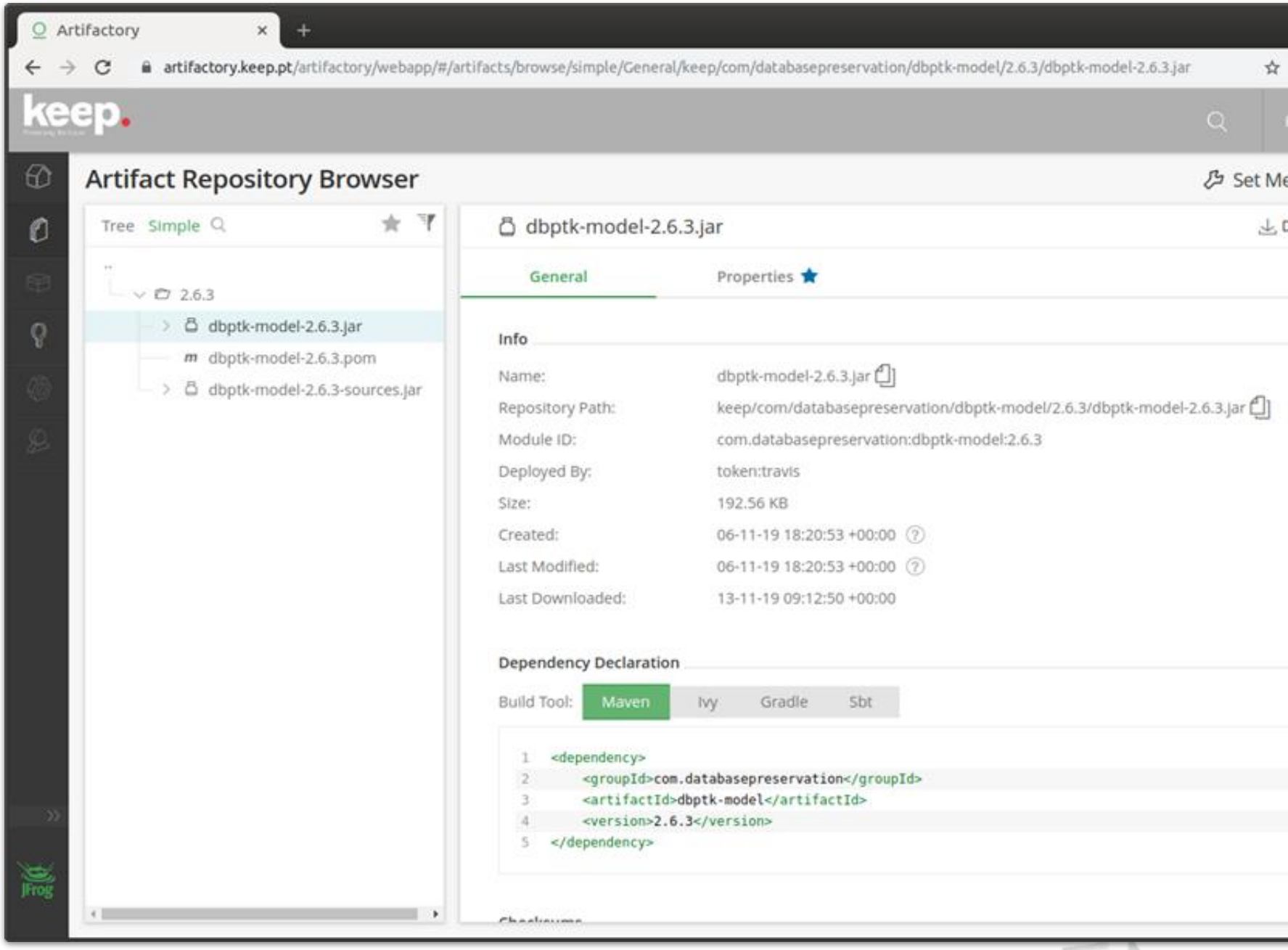
- Command line interface allows easy automation of periodic tasks like saving database to preservation format, validating, and editing metadata.

```
2/2                                  Tilix: Default
~ $ java -jar dbptk-app-2.6.3.jar
Database Preservation ToolkitDatabase Preservation Toolkit (version 2.6.3)
More info: http://www.database-preservation.com

Usage: dbptk COMMAND [OPTIONS]

Commands:

        migrate         Migrates data and metadata from an import module to an export module.
        edit            Edit the metadata information from a SIARD 2 archive.
        validate        Validate a SIARD 2 archive.

Run 'dbptk -h|help COMMAND' for more information on a command.

      Log files and migration reports were saved in /home/mguimaraes
      Troubleshooting information can be found at http://www.database-preservation.com/#troubleshooting
      Please report any problems at https://github.com/keeps/db-preservation-toolkit/issues/new
~ $ _
```

DBPTK Developer features

Systems integration
Java library

- Library to allow integration of production systems to directly use database preservation features.



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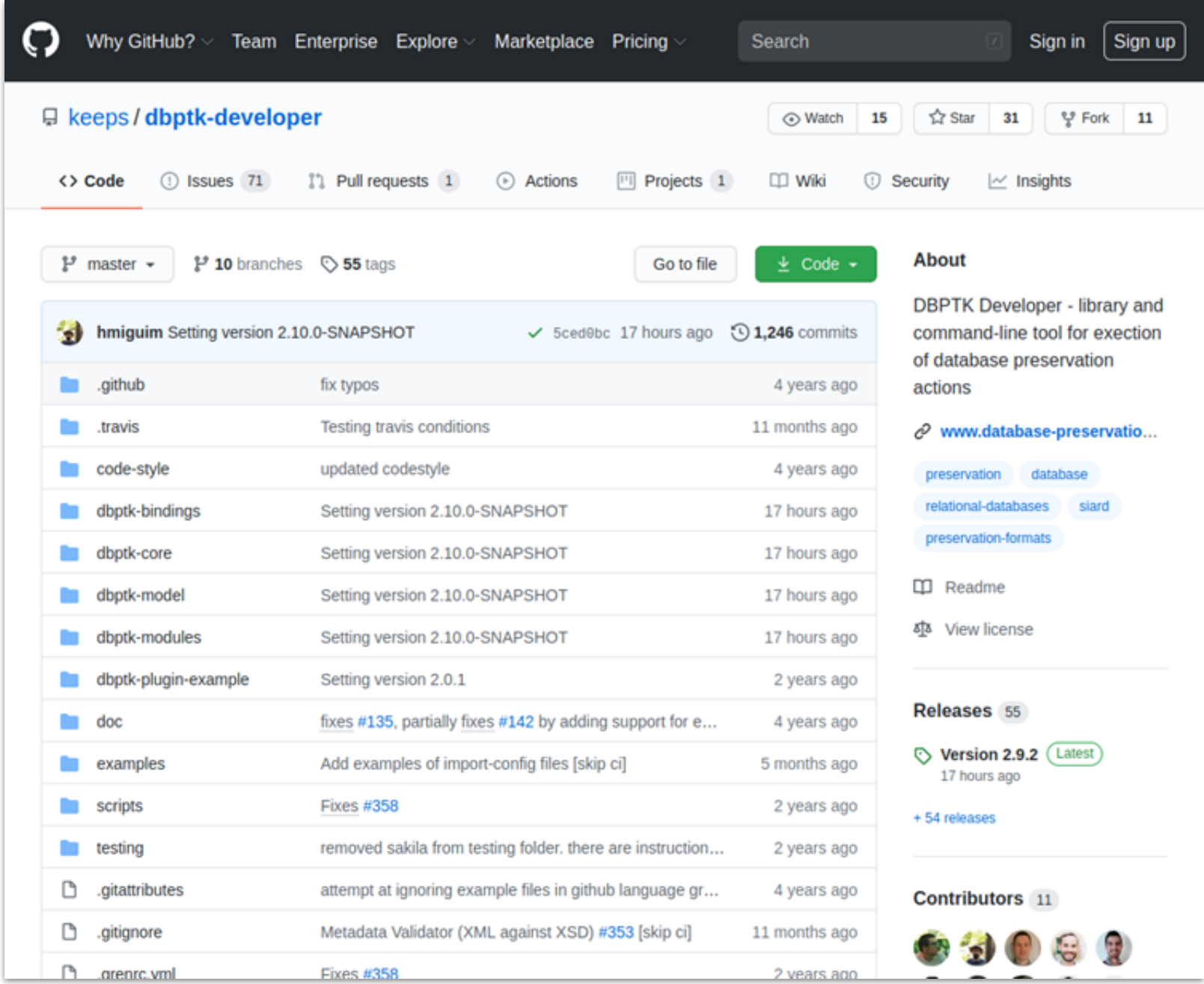
DBPTK Developer features

Open source
For custom development

- Code base that allows custom development of new features or specialized support for new or legacy database systems.



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And many more features

For archiving databases:

- SSH Tunnel
- Selection of tables and columns
- Selection and materialization of views
- Custom views
- External files (files stored outside the DB)
- External files via SSH tunnel
- Automated quality assurance
- Save LOBs outside SIARD file
- Migrate from SIARD to SIARD
- Migrate from SIARD to live DBMS
- Convert ORACLE geodata

For accessing archived databases:

- Configure visible tables
- Configure visible columns
- Set column name, description and order
- Binary columns advanced options
- REST API
- Load on access and auto-unload

DBPTK

	Desktop	Enterprise	Developer
Save to preservation format	✓	✓*	✓
Quality assurance (merkle tree)	✓	✓*	✓
Validation	✓	✓	✓
Enrich descriptions	✓	✓	✓
Browse and search	✓	✓	✗
Transform (de-normalization)	✗	✓	✗
Export to live databases	✓	✓*	✓
Activity Log	✗	✓	✗
Authentication	✗	✓	✗
Number of users	one	many	one
Number of loaded databases	few	many	N/A

* Enterprise feature done via the upload/download of SIARD and usage of related tools

DEMONSTRATION

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Database preservation

Real-world use cases

Hospital legacy databases

Context

Set of **database systems** created to support **specific hospital services** (cardiothoracic, neonatology and neutropenia)

They contain **crucial information** about the **history of some patients** that may be needed for **urgent interventions**

Problem

- Databases were **replaced** by newer systems
- Information was **never migrated** to newer systems
- Original Database Management Systems are **obsolete**
- Original developers and submitters are **gone**
- **Not enough documentation** is available

Hospital legacy databases

Solution

- **Export** of all information into **SIARD**
- **Expert analysis** of original database and interfaces to create **documentation**
- Using **RODA** to keep documentation and **DBPTK Enterprise** to provide access
- Use table and column management and data transformation to make databases more **user-friendly** and **better documented**.

Main software used

- DBPTK Desktop for export into SIARD
- RODA for catalogue and archiving representation information (documentation)
- DBPTK Enterprise for access to database content

Main features used

- Custom views and materialized views
- SIARD metadata edition
- Table and column management
- Data transformation

European Taxation and Customs Union: trader messages archive

Context

New **EU service** that will provide a **centralized interface with customs authorities** for **thousands of economic operators** that bring the **goods into the European Union**.

All **transaction messages** will need to be **archived for a decade**.

Problem

- Estimated **10 million messages per day**
- Production database needs to **offload to archive** daily and purge information
- Must **ensure no message is lost** or mangled in the archival process
- Archive process must **keep up with production**

European Taxation and Customs Union: trader messages archive

Solution

- Archive partial exports of database into SIARD (e.g. 1-hour timespans)
- Archive into RODA and load into DBPTK Enterprise when access is needed
- Continuous extraction, archive and validation workflow
- **Quality assurance is key**

Main software used

- DBPTK Developer for continuous partial export to SIARD
- RODA for archival, search and load into DBPTK Enterprise
- DBPTK Enterprise to access on request and retrieve original message(s)

Main features used

- DBPTK developer automation scripts
- Automated quality assurance

Questions?

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Ready to get started?

Find out more at:
ec.europa.eu/cefdigital

Contact us:
cef-building-blocks@ec.europa.eu

Thank you!