



# Areelle® XBRL Platform

December 10, 2013

# Goals

- Support producers and consumers
  - GUI, Command line, & Web Server
  - Database (SQL, Graph, RDF, JSON)
  - Apache 2 license (no GPL, creative commons)
- Table, formula, versioning, Sphinx
- Plug-in extensions framework
- Foster derived products

# What is Arelle?

The screenshot displays the Arelle software interface for the file 'abc-20101231.xml'. The interface is divided into several panes:

- Left Pane (DTS Properties):** Shows a tree view of the document structure, including 'abc-20101231.xml - instance', 'abc-20101231.xsd - schema', and 'us-gaap-2011-01-31.xsd - schema'.
- Top Pane (Fact Table):** Displays a table of financial data for the years 2008-12-31, 2009-12-31, and 2010-12-31. The table is organized into a hierarchy of concepts.
- Bottom Pane (Concepts):** Shows a table of concepts with columns for Label, Name, ID, and Abstract.

**Fact Table Data:**

Concept	2008-12-31	2009-12-31	2010-12-31
101000 - Document - Document Information			
104000 - Statement - Statement of Financial Position, Classif			
Statement of Financial Condition, Classified [Table]			
Statement of Financial Condition, Classified [Line It			
Assets [Roll Up]			
Assets, Current [Roll Up]			
Cash and Cash Equivalents, at Carrying V9,000		10,000	11,000
Restricted Cash and Investments, Curren		1,000	1,000
Short-term Investments		2,000	1,000
Accounts Receivable, Net, Current		29,000	29,000
Inventory, Net		4,000	4,000
Prepaid Expense, Current		8,000	8,000

**Concepts Table Data:**

Label	Name	ID	Abstract
Cash and Cash Equivalents, at Carrying Value	CashAndCashEquivalentsAtCarryingValue	us-gaap_CashAndCashEquivalentsAtCarryingV	false xbrli:item
Change in Accounting Policy	ChangeInAccountingPolicy	abc_ChangeInAccountingPolicy	false xbrli:item
Class of Common Stock [Axis]	ClassOfCommonStockAxis	abc_ClassOfCommonStockAxis	true xbrldt:dime
Class of Common Stock All Classes IDomain	ClassOfCommonStockAllClassesDomain	abc_ClassOfCommonStockAllClassesDomain	false xbrli:item

# Arelle is:

## ➤ to producers

- XBRL: validates, views, formula, versioning
- Desktop GUI
- Command line and script use
- REST web services API (Java, .Net)
- Plug-in extensions framework

## ➤ to consumers

- Databases: XBRL-US & Abstract Models
- XBRL web views to database

# Implementation

## Python 3.3 (2.7 on GAE)

- Acceptance by financial modeling community
- Python-specific object model and API
- Fresh new code, no reuse of anything
- Ideal for servers (GAE, AWS)
- Databases supported:
  - MySQL, Postgres, MSSQL, Oracle
  - Cassandra, RDF, JSON



# MVC Architecture

## ➤ Model

- Instance, iXBRL, DTS, Table LB, Vers
- Formula/Sphinx objects

## ➤ View

- GUI, file, database

## ➤ Controller

- GUI, Cmd Line, Web Services, custom

## ➤ Plug-in framework

- Database, Excel, SKOS/RDF, extensions

# Eurofiling Support

- Package Manager
  - EBA Manifests (Oasis Catalog, CoreFiling)
- Viewing/Entry
  - GUI
  - HTML and Layout model
  - Database

# Table Linkbase Support

- CR 2013-11-13 (Current)
- Prior PWD versions
  - Eurofiling 2010
  - Montreal 2011
  - 2013-01-16
  - 2013-05-17 (EBA 2.0, EBA 2.0.1)
  - ~~➤ 2013-08-28 not supported~~
  - Collaborators test prior versions

# EBA Package Management

The screenshot shows the 'Taxonomy Packages Manager' application window. On the left, there are buttons for 'Locally' and 'On Web'. The main area contains a table of packages with columns for Name, Version, Status, File Date, Update, and Description. The 'EBAtaxonomyfiles' package is selected and highlighted in blue. Below the table is a 'Remapping' section with two columns: 'Prefix' and 'Remapping'. The details for the selected package are shown at the bottom, including version, description, prefixes, URL, and date. At the bottom right, there are buttons for 'Disable', 'Move Up', 'Move Down', 'Reload', 'Remove', 'Close', and 'Cancel'.

Name	Version	Status	File Date	Update	Description
UK Taxonomies	2009-09-01	disabled	2013-10-07T20:03:21 UTC		UK GAAP, IFRS, Banking and Charitie
CRD IV	ITS-2013-02 2013-09-18	disabled	2013-10-03T22:03:33 UTC		
EBA taxonomy files (none)		disabled	2013-11-23T21:57:17 UTC		oasis catalog
<b>EBAtaxonomyfiles</b>	(none)	enabled	2013-12-06T20:16:10 UTC		oasis catalog

Prefix	Remapping
http://www.eba.europa.eu/	C:\temp\eba\2.0.1\EBAtaxonomyfiles\www.eba.europa.eu\

**EBAtaxonomyfiles**  
version: (none)  
description: oasis catalog  
prefixes: http://www.eba.europa.eu/  
URL: C:\temp\eba\2.0.1\EBAtaxonomyfiles\catalog.xml  
date: 2013-12-06T20:16:10 UTC

Buttons: Disable, Move Up, Move Down, Reload, Remove, Close, Cancel

# Package Management

- Zip manifests (Oasis Catalog, XII)
- Entry points (no fishing for files)
- URL redirection catalog entries
  - Eliminate copying into cache
  - Support multiple packaged versions

# Excel Support Plug-Ins

- Build custom extension taxonomies
  - EDInet, XBRL-US, IFRS
- Adds XBRL Excel capabilities
  - Save to Excel (of an existing DTS)
  - Edit/extend/modify DTS in Excel
  - Load from Excel (re-save to XBRL 2.1)

# Excel example

Link role

Concepts

Sheet 1: Taxonomy

Property Plant Equipment Extended Link											
科目分類	冗長ラベル(英語)	名前空間プレフィックス	要素名	type	substitutionGroup	periodType	balance	abstract	depth	calculation parent	calculation weight
B	Property, Plant, and Equipment, Net, Movements [Abstract]	test	PPENetAbstract	xbri:stringItemType	xbri:item	instant		true	0		
B	Property, Plant, and Equipment, Net	test	PPENet	xbri:monetaryItemType	xbri:item	instant		false	1		
B	Land	test	Land	xbri:monetaryItemType	xbri:item	instant		false	2	test:PPENet	1
B	Buildings, Net	test	Bldg	xbri:monetaryItemType	xbri:item	instant	debit	false	2	test:PPENet	1
B	Furniture and Fixtures, Net	test	Furn	xbri:monetaryItemType	xbri:item	instant		false	2	test:PPENet	1
B	Computer Equipment, Net	test	CompEqp	xbri:monetaryItemType	xbri:item	instant	debit	false	2	test:PPENet	1
B	Other Property, Plant, and Equipment, Net	test	OtherProp	xbri:monetaryItemType	xbri:item	instant	debit	false	2	test:PPENet	1

specification	file type	prefix (schema) type (linkbase) argument (other)	file, href or role definition	namespace URI
extension	schema	test	test.xsd	http://abc.com/test
extension	linkbase	presentation	test-pre.xml	
extension	linkbase	calculation	test-cal.xml	
extension	linkbase	label en	test-lab.xml	
extension	role		Property Plant Equipment Extended Link	http://abc.com/role/PPE

Sheet 2: Import and extension parameters

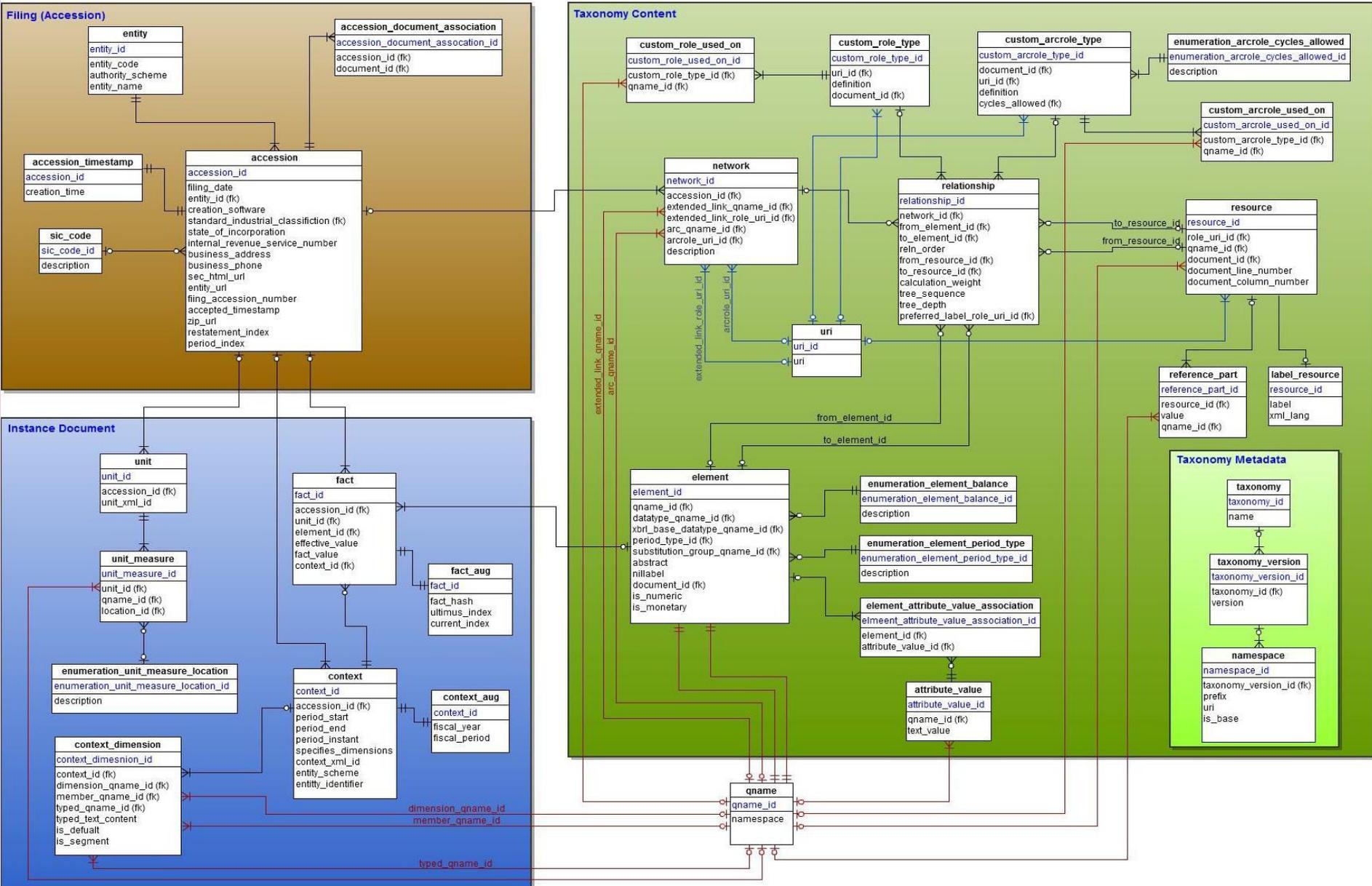
Extension files

Extension link role

# Databases Support

- Bulk load & update database
  - From RSS Feed (like SEC)
  - From files, via GUI, scripts, web API
- XBRL-US Public Database (postgres)
- Abstract Model Database
  - SQL (Postgres, MySQL, MS SQL, Oracle)
  - Graph (Rexter/Titan/Cassandra)
  - RDF
  - JSON

# XBRL-US Public schema



# Installing XBRL-US Postgres DB

## ➤ Install Postgres

- Create database, user, password

## ➤ Install Arelle

- Help->manage plug-ins, choose xbrlDB/init

## ➤ Run *RSS feeds* or cmd scripts

- `arelleCmdLine -f c:\temp\test.rss -v --disclosureSystem efm-pragmatic-all-years --store-to-XBRL-DB "host, port, user, pwd, database, 90, postgres"`



# Abstract Model Graph Database

- Social networking technology (Facebook)

- Rexter interface, Titan data store

- Multiple backends (Cassandra, HBase)

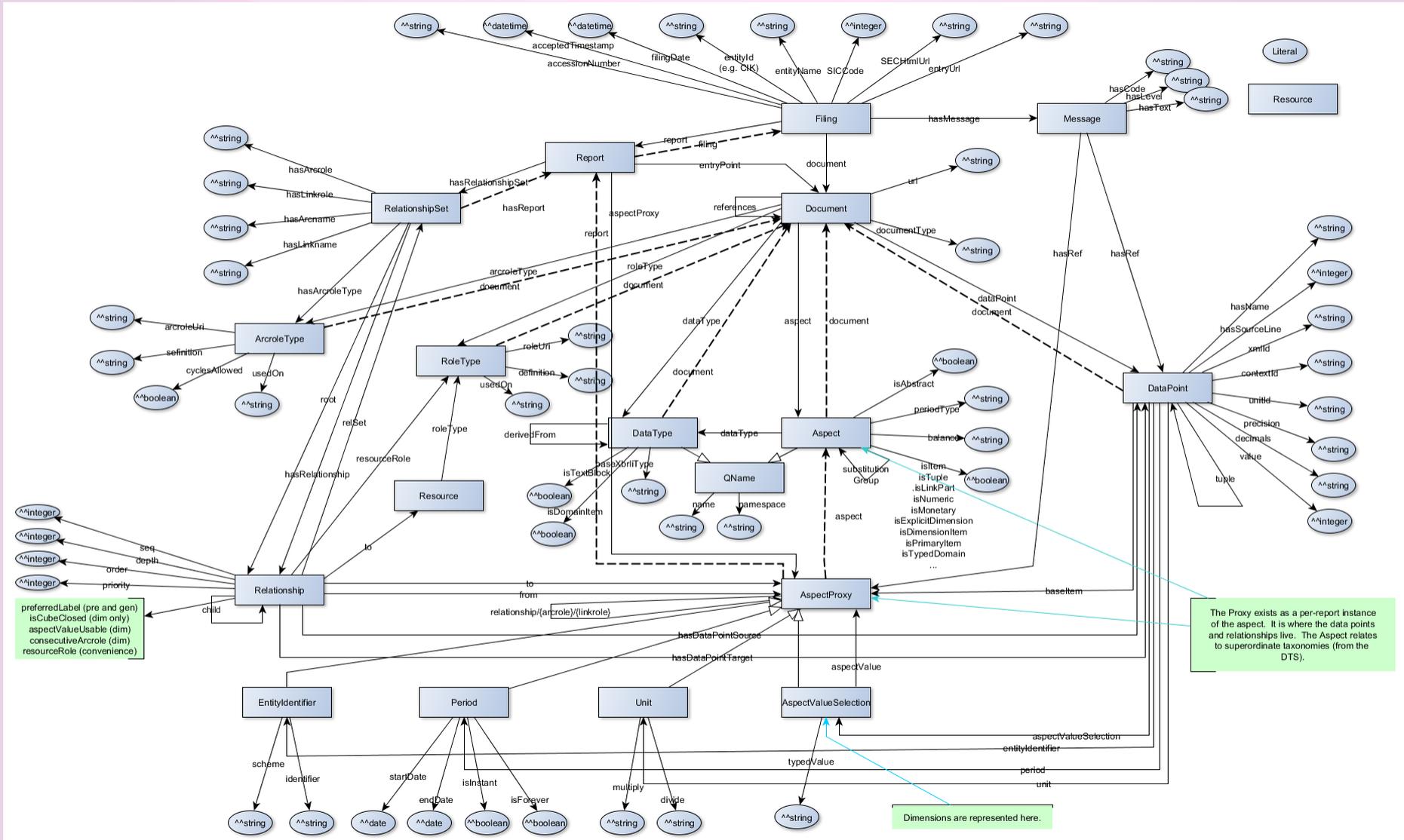
- Gremlin / Groovy query (tinkerpop)

- Run *RSS feeds* or cmd scripts

- `arelleCmdLine -f c:\temp\test.rss -v --disclosureSystem efm-pragmatic-all-years --store-to-XBRL-DB "host, port, user, pwd, database, 90, rexter"`



# RDF Model



# Abstract Model to RDF

## ➤ RDF stores

- Files (turtle, XML)

- Database NanoSparqlServer

## ➤ Run *RSS feeds* or cmd scripts

- `arelleCmdLine -f c:\temp\test.rss -v -  
disclosureSystem efm-pragmatic-all-years  
--store-to-XBRL-DB rdfFile,,,,  
c:\abc\test.turtle,600,rdfDB"`



# Abstract Model JSON Database

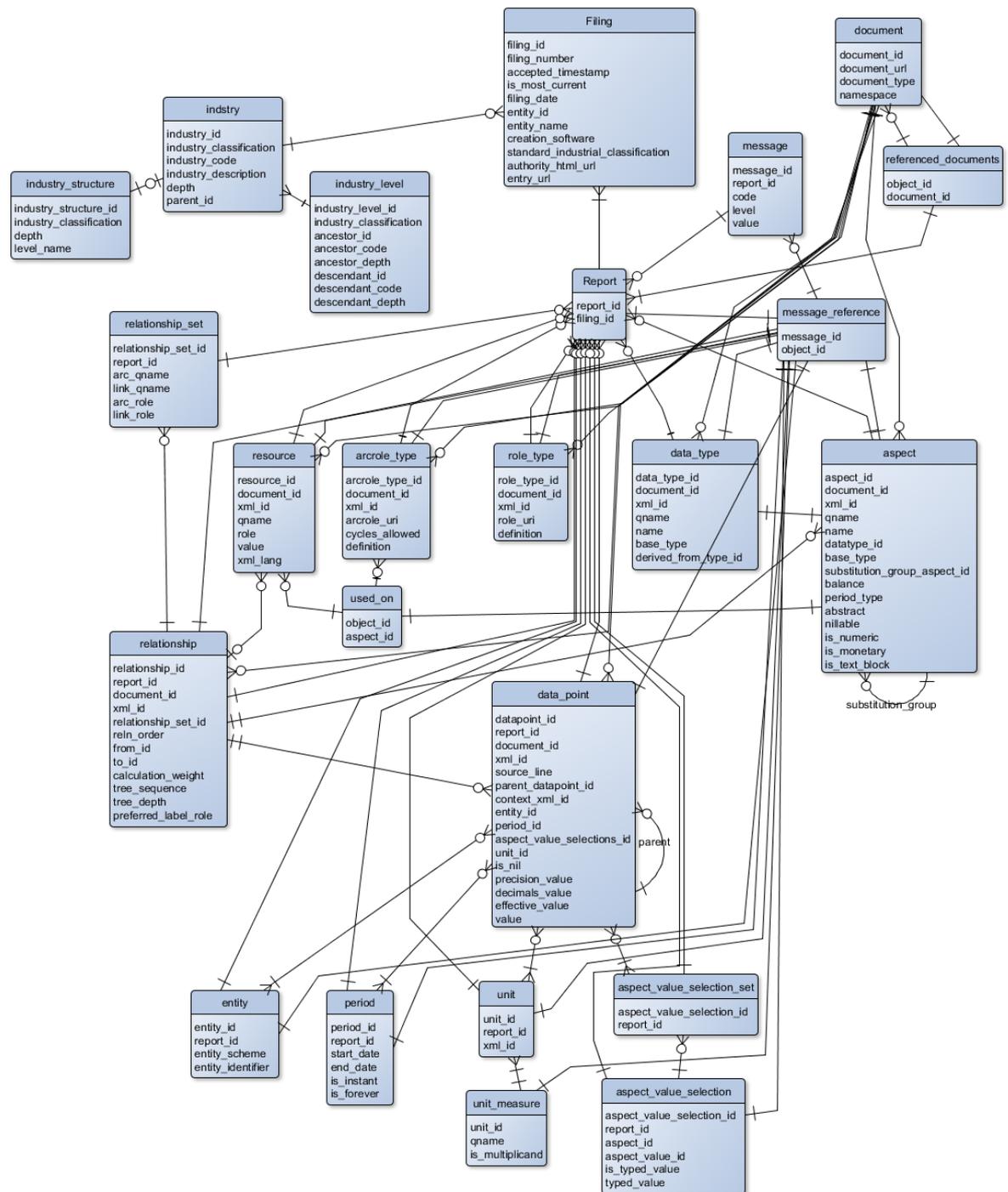
- JSON file syntax

  - MongoDB interesting, size issues

- Run *RSS feeds* or cmd scripts

  - `arelleCmdLine -f c:\temp\test.rss -v - disclosureSystem efm-pragmatic-all-years --store-to-XBRL-DB jsonFile,,,, c:\abc\test.json,600,json"`

# SQL Abstract Model



# Abstract Model SQL Database

## ➤ SQL for MySQL, MSSQL, Oracle, Postgres

➤ `arelleCmdLine -f c:\temp\test.rss -v - disclosureSystem efm-pragmatic-all-years --store-to-XBRL-DB host,port,user,pwd, database,600,pgSemantic`

➤ `pgSemantic` - Postgres

➤ `mysqlSemantic` - MySql & Cloud SQL (GAE)

➤ `mssqlSemantic` - MS SQL Server (2011)

➤ `orclSemantic` - Oracle 11g

# What is Next?

- Improve performance
  - Object model serialization
- Excel features
  - Instance & Table LB
- Database features
  - Update for Table LB