



CompuGroup
Medical

TermX @ CGM

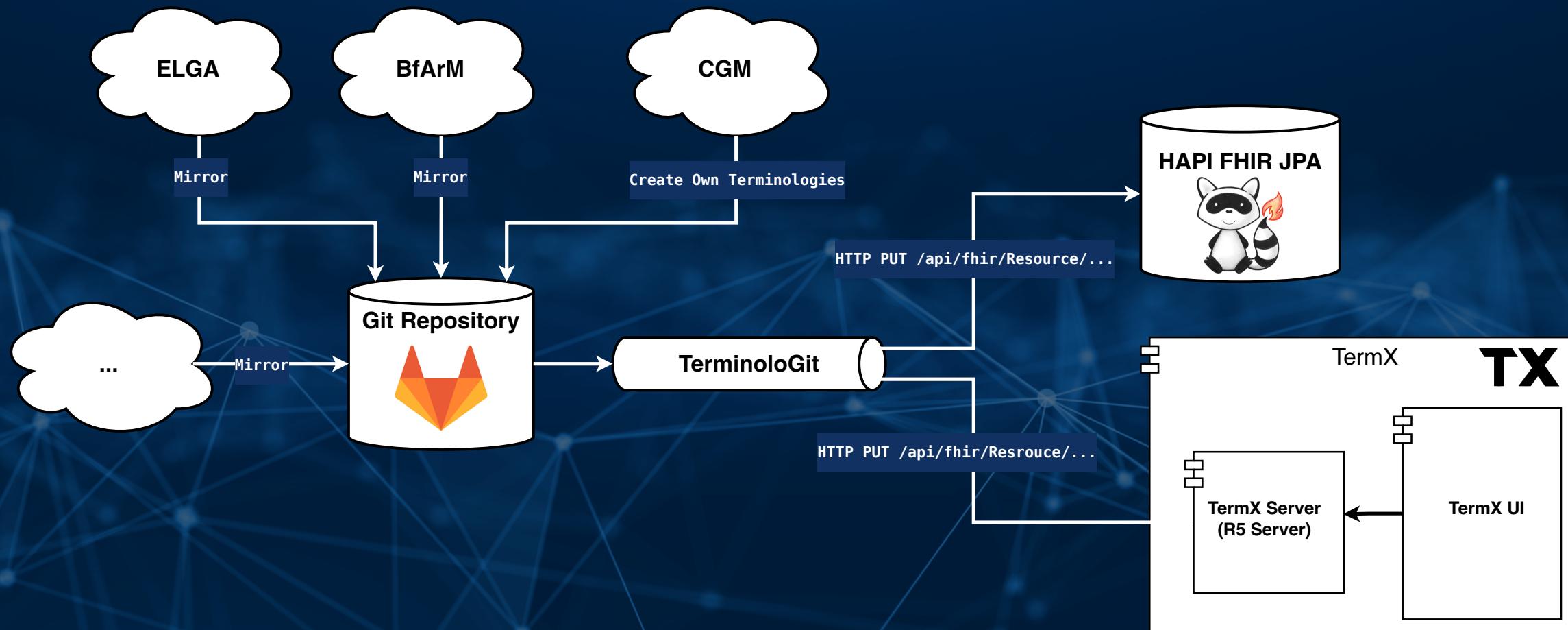
Why & How we are using TermX



Where Are We Coming From?

- We want to build an internal Terminology Server
- Need to synchronize external Terminologies like
 - ELGA
 - BfArM
 - ...
- Author & Manage our own Resources
- Overview of all Resources

Setup @ CGM



Major Pain Points

- IG creation
 - very time-consuming
 - even without any validation
 - Fragile
 - Package updates sometimes broke the IG creation
- Resource Authoring
 - Manual usage of SNOMED CT concepts
 - ConceptMap generation

What is TermX¹

- Open Source – maintained by Igor Bossenko
- Terminology Server
- Model Designer
- Transformation Editor
- Authoring & Publishing Tool

TermX Features I

- ICD10 Support
 - ICD11 is currently being worked on
- LOINC Support
- SNOMED CT Integration via SnowStorm
- SNOMED CT Management
 - Editions
 - Branches
- Orphanet — Rare Diseases

TermX Features II

- Resource Authoring
- Fast Global Search
- Release Management
- Version Diffs
- Wiki

TermX Features III

- ! FML Transformation
 - We have not figured this out yet
- User Management & RBAC
- FHIR \iff FSH
- Provenance

TermX @ CGM

- Still in Evaluation & Tryout Phase
- Replacement/Alternative for Implementation Guides
- ConceptMap creation
- CodeSystem & ValueSet creation
- SNOMED CT integration & ValueSet creation based on SNOMED Codes

Planned Usage @ CGM

- Resource Authoring
 - Snomed CT integration
 - ConceptMap creation
- UI for all Terminologies
 - Search
 - Diff
- *Add created Resources into TerminoloGit*
 - *still in planning*
 - *TermX as Viewer / Authoring and IG replacement*

Shortcomings / Issues

- Validation of Resources
 - We were not yet able to feed Resources that reference a `StructureDefinition`.
- FHIR 5 only
- `Resource.Id` handling of Resources with existing Ids.
 - `Resource.id+Resource.version` can lead to invalid Ids.
- `ConceptMaps` are not supported via FHIR API

Shortcomings - UI

- UI sometimes lacks information
 - ConceptMap only contains *sourceCode*, *relationship* and *destinationCode*.
- ConceptMap authoring is still a bit of a mystery
- It has a *very very steep* learning curve
- Orphanet Rare Diseases can kill UI
- SNOMED-CT search does not show if concepts are retired.

Showcase

Set up

Follow the instructions of the README ¹

1. Make sure that you have installed Docker. In case you are not allowed to use Docker Desktop you can use one of the following free alternatives:

- Rancher Desktop
- Podman

2. Run `docker-compose up -d` to startup TermX
3. Run `docker-compose logs --follow` to monitor the startup logs.
4. Access `localhost:4200` on the browser of your choice

IMPORTANT:

Do not use the login button because User Authentication is NOT enabled!

Overview

- FHIR R5
- User and Task Management

^ **TermX**

Dashboards	Terminology	External resources	Wiki	Modeler	Management
Landing page	Code systems	SNOMED CT browser	Wiki	Structure definitions	 Tasks
Global search	Value sets	SNOMED CT management	Templates	FML transformations	 Spaces
	Map sets	LOINC		Implementation guide	 Servers
	Naming systems	Measurement units			 Releases
	Association types	Observation definition			 Checklist
	Defined properties				 Privileges
	 Import				 Terminology service API
					01 Sequences 

CodeSystem and ValueSet

Existing Terminology

- Summary
- Edit
- Concepts
 - hierarchical Concepts ¹
- Provenance

1. <https://termgit.elga.gv.at/ValueSet-appc-anatomie.html>

Create a new ValueSet

- Via API¹

```
POST http://localhost:4200/api/fhir/ValueSet
```

```
-H: Content-Type: application/fhir+json  
-H: accept: */*
```

```
Body: ValueSet (json)
```

- Via External FHIR definition import
- Manual (TermX)

1. <https://termgit.elga.at/ValueSet-elga-formatcode.html>

SNOMED

- Global Search
 - Inactive Codes are still present
- Browser
- Management

SNOMED CT

Taxonomy Refsets ECL

SNOMED CT Concept / SNOMED CT Concept

- ▼ Body structure (body structure)
- ▼ Clinical finding (finding)
- ▼ Environment or geographical location (environment / location)
- ▼ Event (event)
- ▼ Observable entity (observable entity)
- ▼ Organism (organism)
- ▼ Pharmaceutical / biologic product (product)
- ▼ Physical force (physical force)
- ▼ Physical object (physical object)
- ▼ Procedure (procedure)
- ▼ Qualifier value (qualifier value)
- ▼ Record artifact (record artifact)
- ▼ Situation with explicit context (situation)
- ▼ SNOMED CT Model Component (metadata)
- ▼ Social context (social concept)
- ▼ Special concept (special concept)
- ▼ Specimen (specimen)
- ▼ Staging and scales (staging scale)
- ▼ Substance (substance)

Use in ValueSet

- Include/Exclude based on
 - all Concepts of CodeSystem/ValueSet
 - exact Concepts of CodeSystem/ValueSet
 - Bulk Copy
 - Expression Constraint Language (ECL)

LOINC

LOINC Part Answer List

Search		Contains	Equals								
LOINC	LONG COMMON NAME	COMPONENT	PROPERTY	TIMING	SYSTEM	SCALE	METHOD	CLASS	TYPE	VALUES	ORD/OBS
100000-9	Health informatics pioneer and the father of LOINC	Health informatics pioneer and the father of LOINC	Hx	Pt	^Patient	Nar		H&P.HX			0
100001-7	Health informatics pioneer and cofounder of LOINC	Health informatics pioneer and cofounder of LOINC	Hx	Pt	^Patient	Nar		H&P.HX			0
100002-5	Specimen care is maintained	Specimen care is maintained	Find	Pt	^Patient	Ord		SURVEY.PNDS			0
100003-3	Team communication is maintained throughout care	Communication Team communication is maintained throughout care	Find	Pt	^Patient	Ord		SURVEY.PNDS			0
100004-1	Demonstrates knowledge of the expected psychosocial responses to the procedure	Demonstrates knowledge of the expected psychosocial responses to the procedure Procedure	Find	Pt	^Patient	Ord		SURVEY.PNDS			0
100005-8	Demonstrates knowledge of nutritional management related to the procedure	Demonstrates knowledge of nutritional management related to the procedure Nutritional Procedure	Find	Pt	^Patient	Ord		SURVEY.PNDS			0
100006-6	Demonstrates knowledge of medication management	Medication Demonstrates knowledge of medication management	Find	Pt	^Patient	Ord		SURVEY.PNDS			0

ConceptMaps

- Not all **ConceptMap** relationships are modeled.
 - Can be defined additionally
 - However, not fully considered correctly
- Model of **ConceptMap** is partly proprietary

Feedback

- Would you use TermX?
 - How?