

An aerial night view of a city, likely Paris, featuring a river (the Seine) flowing through the center. The left bank is filled with traditional European-style buildings, while the right bank is dominated by modern, illuminated skyscrapers. The overall scene is dark with city lights providing contrast.

Building an «AI Coding Harness» for FileMaker

Marcel Moré

Agents!



Building AI Agents with n8n and FileMaker

Marcel Moré



An aerial night view of a city, likely Copenhagen, featuring a river (Nørrebro) and several modern skyscrapers (The Circle, The Circle II, and The Circle III) on the right side. The city lights are visible in the background, and the sky is dark blue.

Agents! Superpowers













Q



Fit

Re-layout

Export PNG

NON-MATCHES

Dim

Hide

TRACE

Neighborhood

Selective flow graph — the call chain up/down, the objects it actually touches, and the script triggers of entered layouts.

BUDGETS

Upstream

3



Downstream

6



Trigger cascade

1



OPTIONS

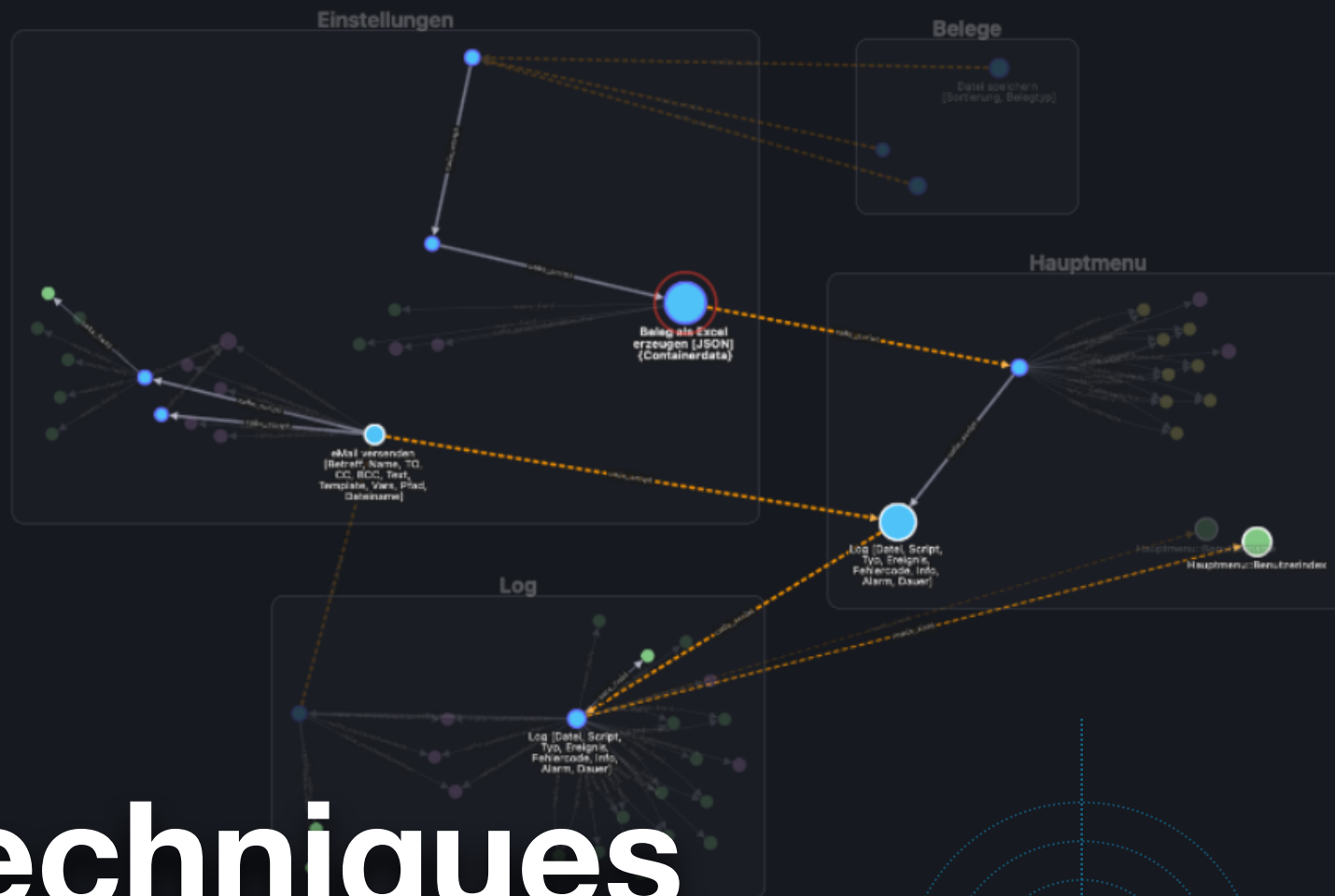
- ☐ Local \$ variables
- ☐ Buttons
- ☐ Interaction triggers
- ☐ Expand callers

SUGGESTIONS

- + Log [Daten, Script, Typ, Ereignis, Fehlercode, Info, Alarm, Dauer]
- + Datei speichern [Sortierung, ... Belege]

LEGEND

- Call chain
- Touched
- Triggered (cascade)
- Touched by cascade



Secret Techniques

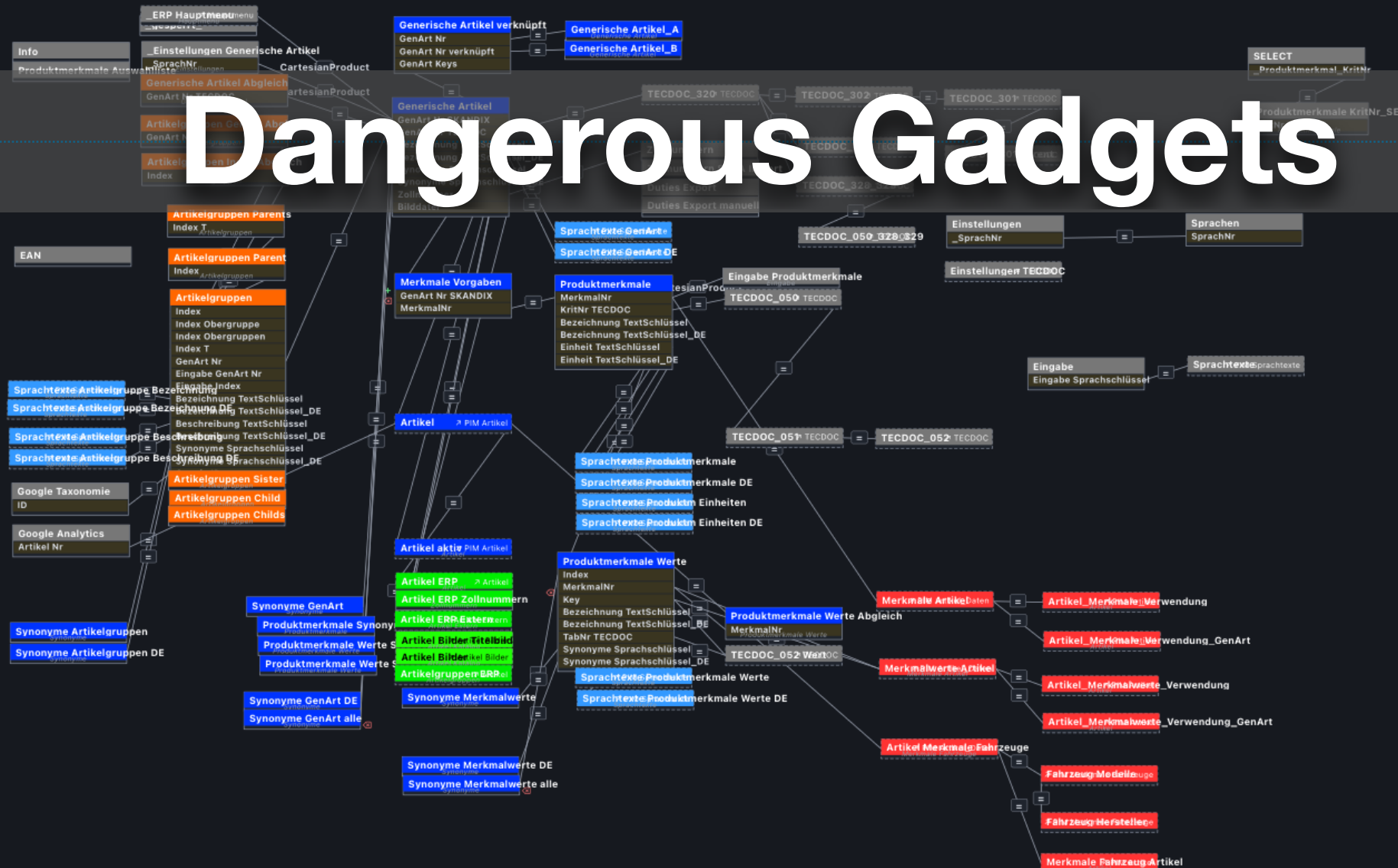
File:

PIM Generische Artikel

Search table occurrence...

Fit

100%



Precision Weapons

Layout: Generischer Artikel (Generische Artikel)

PIM Generische Artikel

Search layout object...

85 matches

Name

Type

Fit

100%

248 objects · Zoom 93%

Input (85)

Display (62)

Viewer (2)

Action (70)

Controls (20)

Groups (1)

Graphic (8)

CALCULATIONS

Conditional Formatting (12)

Hide Condition (8)

Triggers (2)

Tooltip (9)

[Details](#)

[Clear filters](#)

The image shows a detailed view of a software layout for a 'Generischer Artikel' (Generic Article) form. The layout is complex, featuring numerous input fields, buttons, and containers. Key elements include:

- Header:** A search bar labeled 'Search layout object...' with '85 matches' and filters for 'Name', 'Type', 'Fit', and '100%'. It also shows '248 objects · Zoom 93%'.
- Filters:** A row of buttons for 'Input (85)', 'Display (62)', 'Viewer (2)', 'Action (70)', 'Controls (20)', 'Groups (1)', and 'Graphic (8)'. Below this are 'CALCULATIONS' and 'Conditional Formatting (12)', 'Hide Condition (8)', 'Triggers (2)', and 'Tooltip (9)'.
- Main Body:** A large area containing various form elements, including text fields, buttons, and containers. Notable elements include 'Generische Artikel::Bezeichnung...', 'Generische Artikel::Bildvorschau', 'Artikel Katalog::Bild', 'Generische Artikel::Ge...', 'Edit Box', 'Generische Artikel::Bilddatei', 'Zollnummern::Bezeichnung kurz', 'Generische Artikel::Zollnummer', 'Artikel::Zollnummer', 'Artikel::Zollnummer Bezeichnung', and 'Artikel Extern::Zollnummer'.
- Footer:** A row of buttons labeled 'Neu...', 'Suchen...', 'Artikel zeigen', and 'Bilder zeigen'.

The entire layout is overlaid with a large, semi-transparent text 'Precision Weapons' on the left side. The background of the image is a dark, blue-toned aerial view of a city at night.

XML Import: SKANDIX

Imports all files from the xml/ directory into DuckDB.

Split

Import

Resolve

Details

Catalog

Link

Validate

Communities

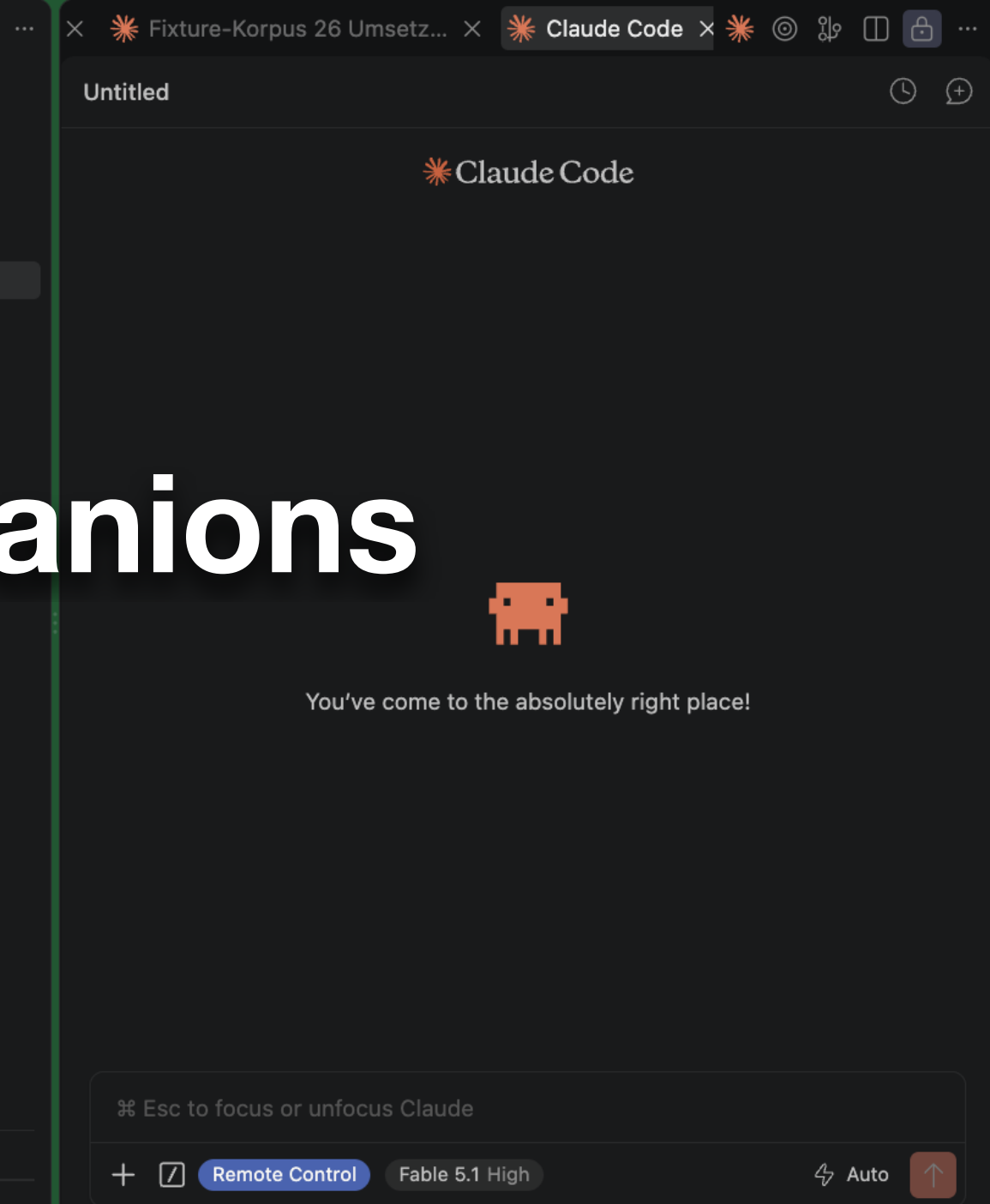
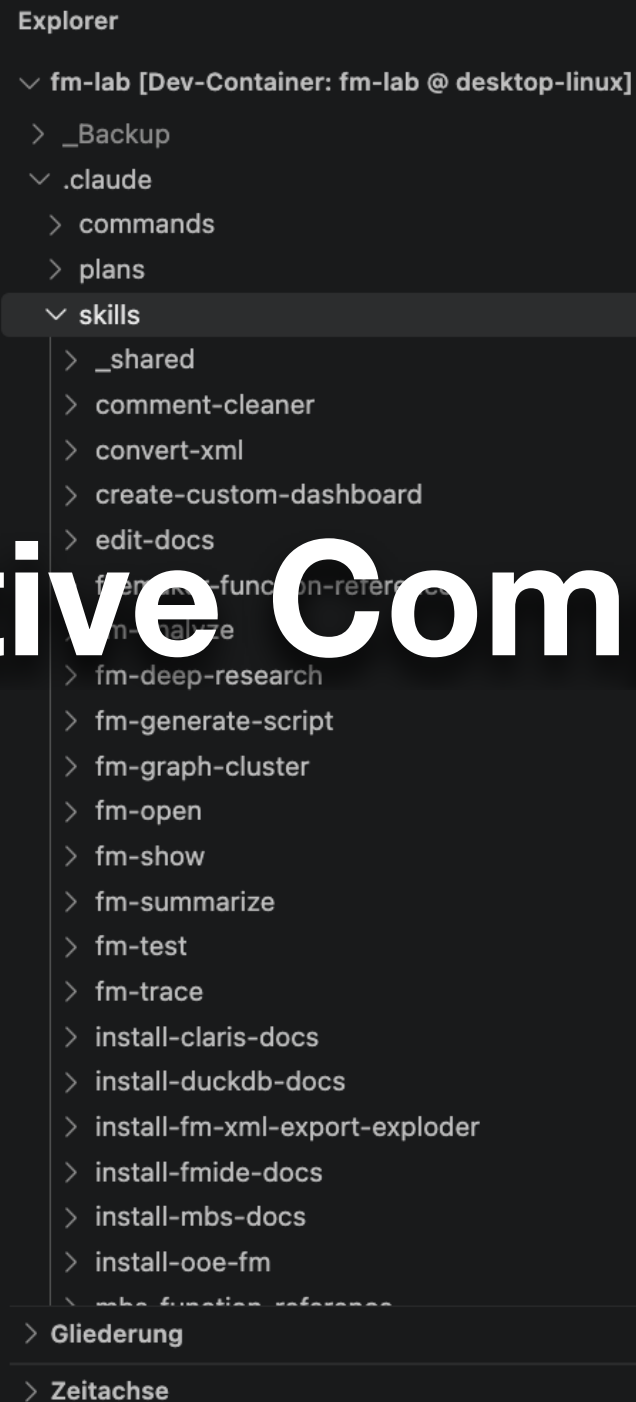
59 entries - Total size 1.17 GB

Search...

FILE	DATE	SIZE	IMPORTED
* Adressen.xml 17 of 28	1/19/2026	47.5 MB	2 minutes ago
* Amazon Abrechnungsliste.xml 1 of 5	1/19/2026	1.6 MB	2 minutes ago
● API.xml	1/19/2026	556.5 KB	2 minutes ago
* Artikel Bilder.xml 8 of 13	1/19/2026	14.4 MB	2 minutes ago
* Artikel Browser.xml 2 of 7	1/19/2026	2.9 MB	2 minutes ago
* Artikel Einkauf.xml 14 of 21	1/19/2026	25.2 MB	2 minutes ago
* Artikel Extern.xml 10 of 19	1/19/2026	20.4 MB	2 minutes ago
* Artikel Import.xml 8 of 13	1/19/2026	14.8 MB	2 minutes ago
* Artikel Liste.xml 7 of 13	1/19/2026	17.6 MB	2 minutes ago
* Artikel.xml 41 of 78	6/18/2026	154.6 MB	2 minutes ago
* Aufträge Einkauf.xml 6 of 14	1/19/2026	10.2 MB	2 minutes ago
* Aufträge Verkauf.xml 5 of 17	1/19/2026	14.2 MB	2 minutes ago
● Auswertungen Ergebnisse.xml	1/19/2026	1.8 MB	2 minutes ago
* Auswertungen.xml 17 of 31	1/19/2026	38.2 MB	2 minutes ago
* Auswertungskonten.xml 10 of 15	1/19/2026	20.3 MB	2 minutes ago
* ...	1/19/2026	...	...
* ...	6/18/2026	127.1 MB	2 minutes ago
* ...	1/19/2026	20.0 MB	2 minutes ago
* Belegpositionen Verkauf.xml 15 of 25	1/19/2026	26.6 MB	2 minutes ago
* Benutzer.xml 5 of 12	1/19/2026	10.2 MB	2 minutes ago
* Bestände.xml 4 of 9	1/19/2026	6.9 MB	2 minutes ago
* Bilder Schnittstelle.xml 6 of 7	7/2/2026	8.9 MB	2 minutes ago
* Buchhaltung.xml 10 of 22	1/19/2026	25.3 MB	2 minutes ago
* CallerAPI.xml 1 of 6	1/19/2026	2.5 MB	2 minutes ago

High-Speed Machines

Attractive Companions







An aerial, grayscale photograph of a cityscape. A wide river flows through the center, with a bridge visible in the distance. On the right side, several tall, modern skyscrapers with grid-like window patterns stand out. The left side of the image shows a dense urban area with lower-rise buildings. The sky is overcast with soft clouds.

Intro

Who?

About...

- Self-employed as developer and information designer for 38 years
- **FileMaker** enthusiast since Version 2
- Specializes in customized solutions for clients in industry, trade, marketing
- Host of FileMaker Usergroup Braunschweig (Germany)
- Author and Speaker for FileMaker related topics



Marcel Moré



Presentations...

FMK FileMaker
Konferenz



vienna
calling

engageU

2011 FileMaker als Multitalent für komplexe Schnittstellen

2012 100% automatisierte Katalog-Produktion

2013 Entwickler-Werkzeuge

2013 Das Matroschka Prinzip

2015 The Power of JavaScript

2016 Dojo kun for the Martial Art of Programming

2016 The Power of SVG

2021 FileMaker and Node-Red

2021 Building a FileMaker-Server Dashboard with Node-Red

2022 Die Zukunft von FileMaker

2023 Claris Platform Update – The Bottom Line

2024 Integrating DuckDB

2024 Integration DuckDB with FileMaker (Part 2)

2025 Building AI Agents



AGENT 007

14:27:09

MISSION TIME 01:27:09

 DIRECTIONS
ENCRYPTED GPS

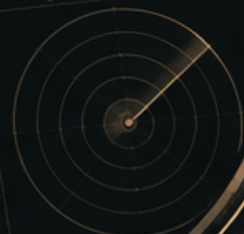
 COMMS
SECURE CHANNELS

 BIOMETRICS
STABLE

 EQUIPMENT
STATUS OK

 O₂ OXYGEN
100%

 EMP READY



Fasten your seatbelts...



An aerial photograph of a city, likely London, showing a mix of historic and modern architecture. A prominent tall, modern skyscraper with a grid-like facade stands on the right side. The rest of the city is composed of lower-rise buildings, streets, and green spaces. The entire image is covered with a semi-transparent blue filter.

The Challenge **Save the World!**

The background of the slide is a dark blue overlay on a grayscale aerial photograph of a city. The city features a mix of low-rise and high-rise buildings, with a prominent skyscraper on the right side. The text is centered in the upper half of the image.

The Challenge **FileMaker Coding** **with AI Agents**

The Subject

A **mission-critical** FileMaker solution
evolving for **30 years** – and still growing

*Can an agent
actually understand this?*

The Challenge

FileMaker Coding with AI Agents

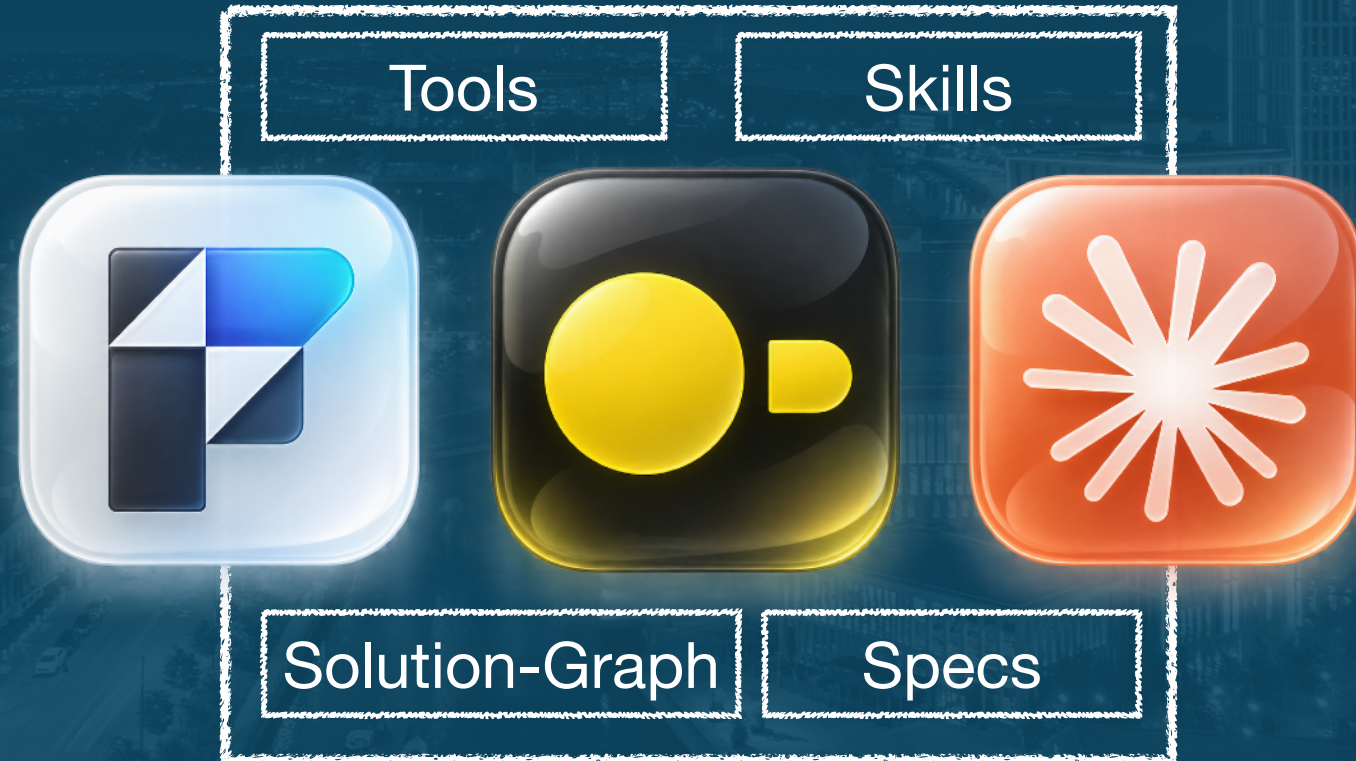


?



The Solution

FileMaker Coding Harness for AI Agents



An aerial night view of a city, likely New York City, featuring a river (the Hudson) and several prominent skyscrapers, including the Empire State Building. The image is overlaid with a dark blue filter. The text "What is a Harness?" is written in large, bold, yellow letters, and "specifically, an agent harness" is written in smaller, white letters below it.

What is a Harness?

specifically, an agent harness

A dramatic illustration featuring two men in dark suits engaged in a physical struggle. The man on the left is in a dynamic, forward-leaning pose, while the man on the right is being pushed back, his head tilted upwards. The background is dominated by a large, stylized sun with a gradient from orange to red. The overall style is high-contrast and graphic, with a focus on the silhouettes of the figures.

Raw power



Skills Tools Understanding

What is a Harness?

Raw Power

modern
agentic models



Skills



Templates

Tools



API

Understanding

FileMaker



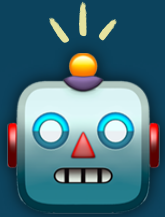
specs

Your Solution



object
model

Why the harness ?



Agents **don't need more intelligence.**



They need better access to context.

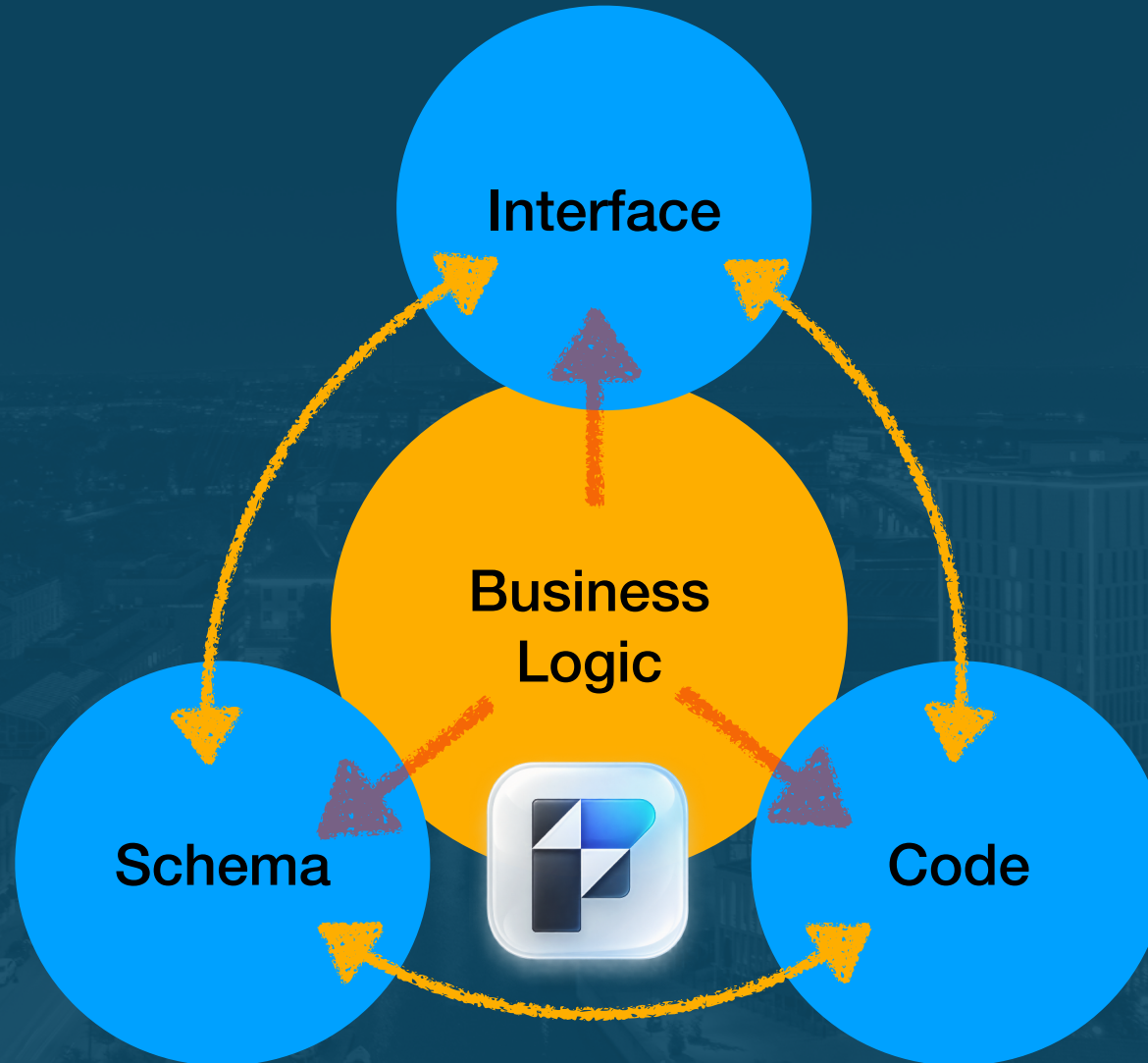
Structure → Semantics → Rules → Tools

An aerial night view of a city, likely New York City, featuring a river (the Hudson) and several prominent skyscrapers, including the Empire State Building. The image is dark blue, with city lights visible in the background and on the buildings. The text is overlaid on the left side of the image.

How to decode FileMaker

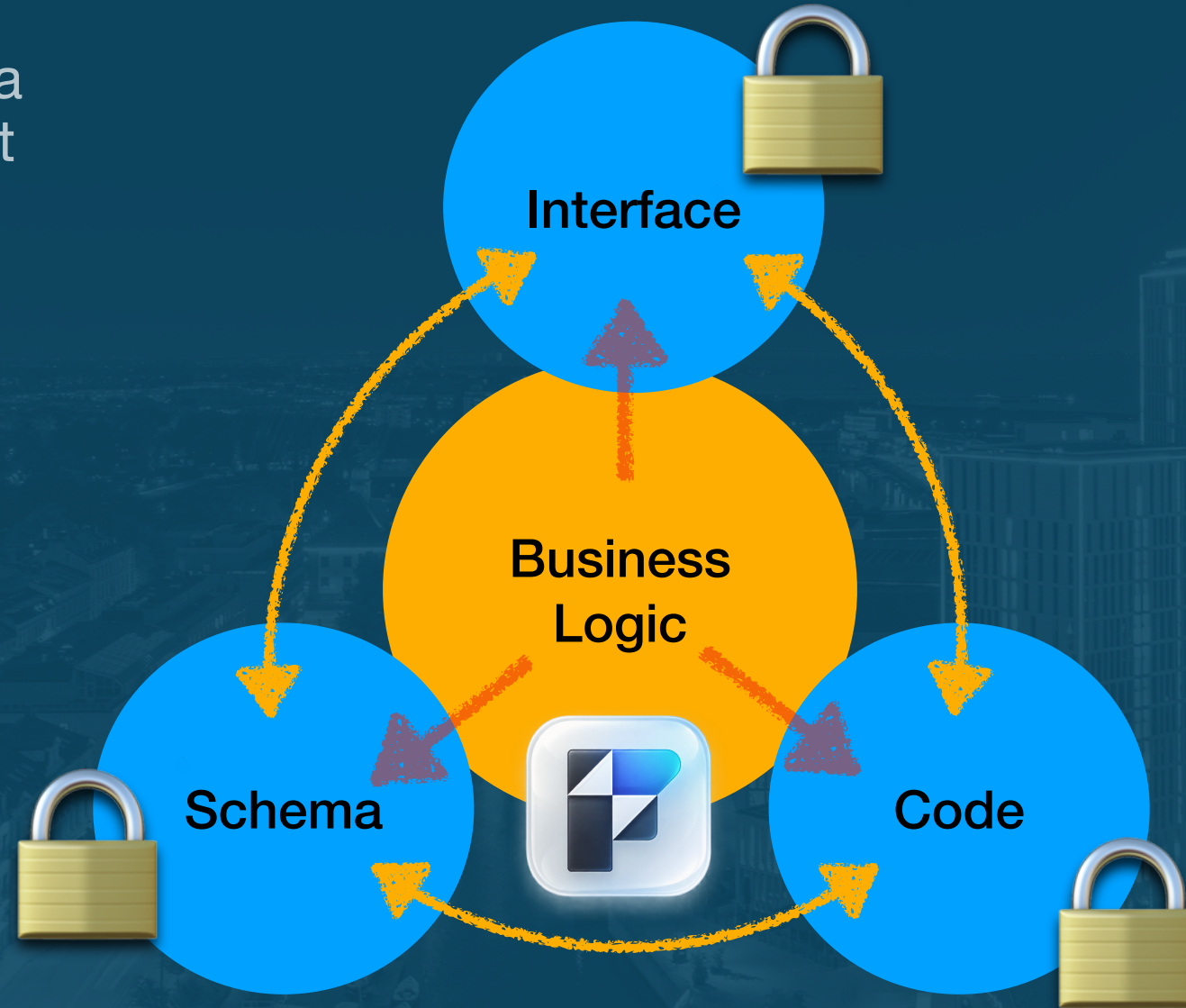
to make the Agent understand

A FileMaker Solution



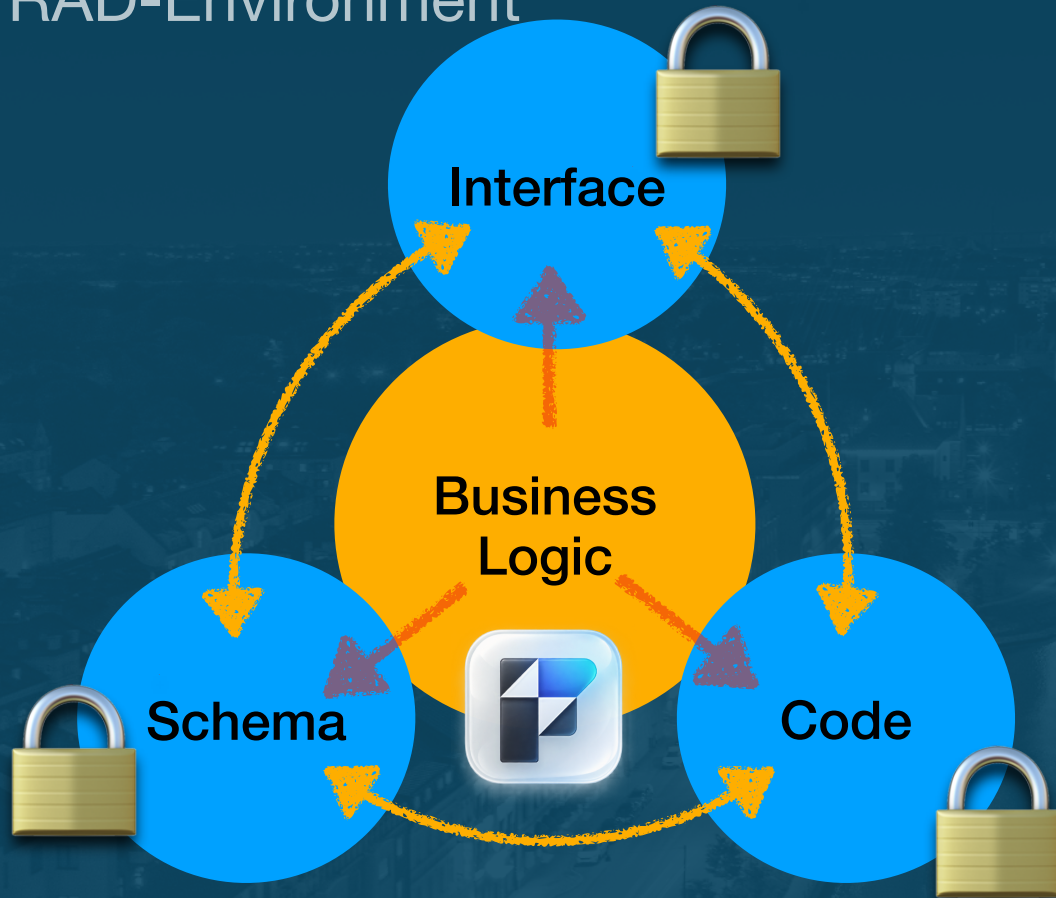
Encapsulated IDE

makes sense for a
RAD-Environment



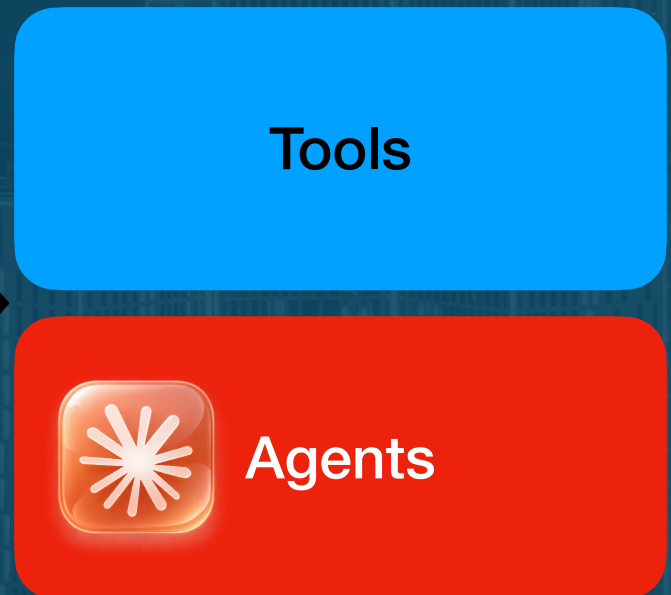
Encapsulated IDE

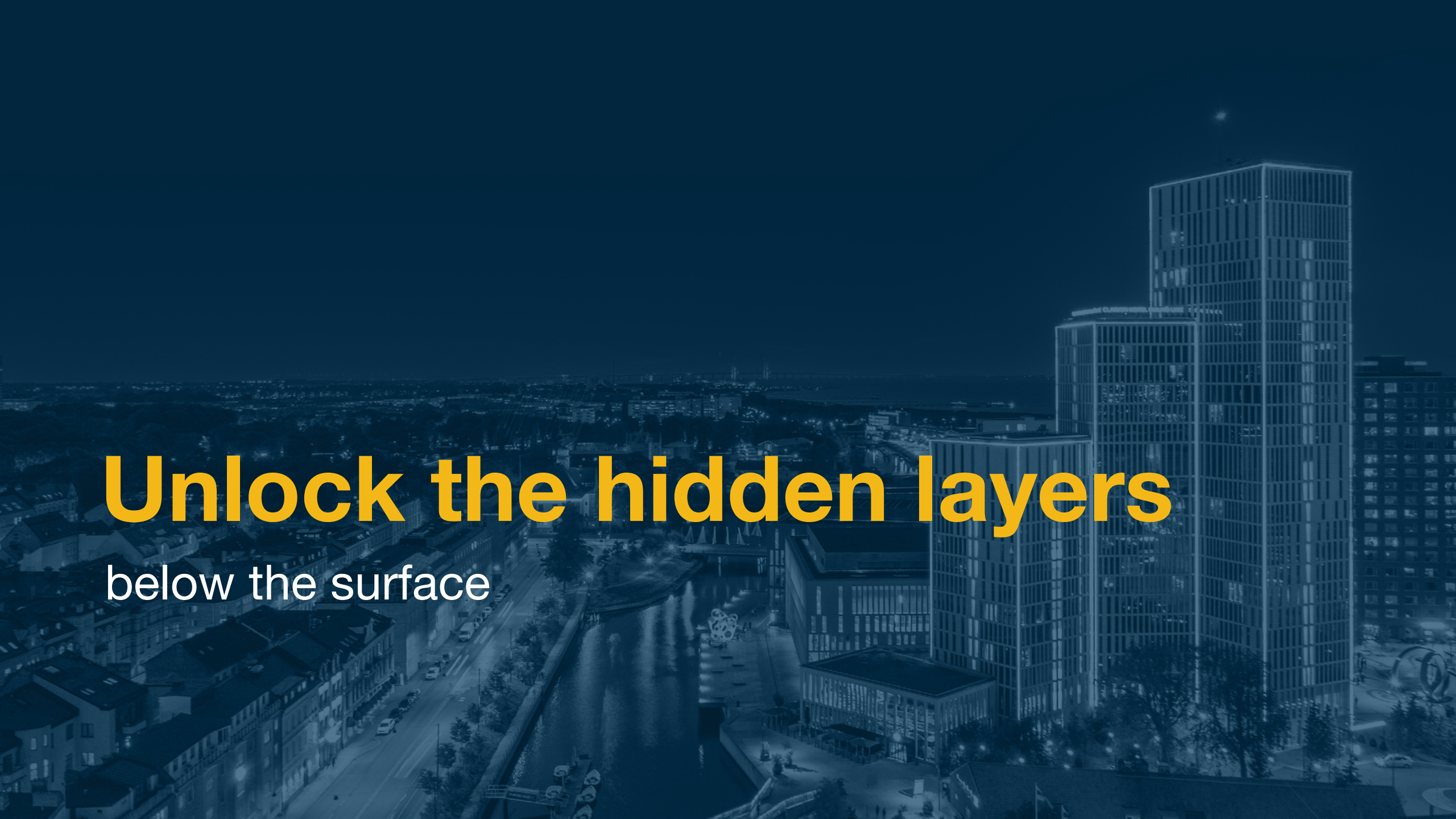
makes sense for a
RAD-Environment



Open IDE

makes sense for
Agentic Workflow



An aerial night view of a city, likely Copenhagen, featuring a river (Nørrebro) and several modern skyscrapers. The image is overlaid with a dark blue filter. The text "Unlock the hidden layers" is prominently displayed in yellow, and "below the surface" is in white below it.

Unlock the hidden layers

below the surface



Implicit Distinction



Representation



Meaning

Implicit Distinction

Dialogs

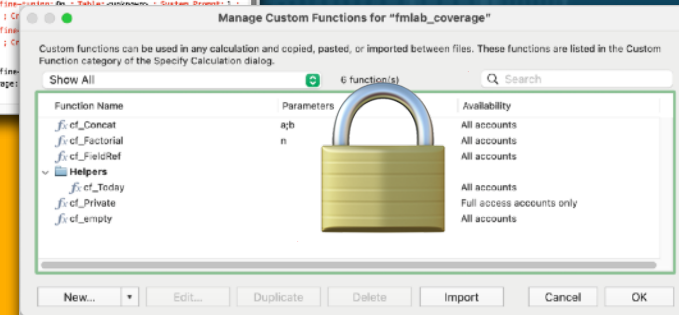
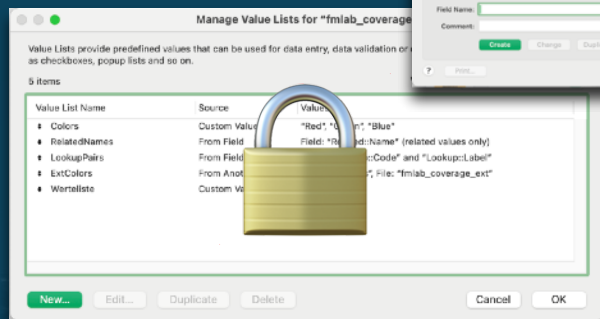
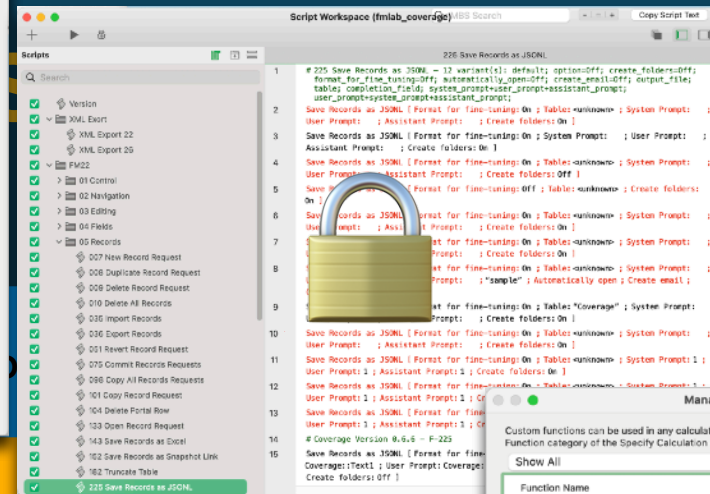
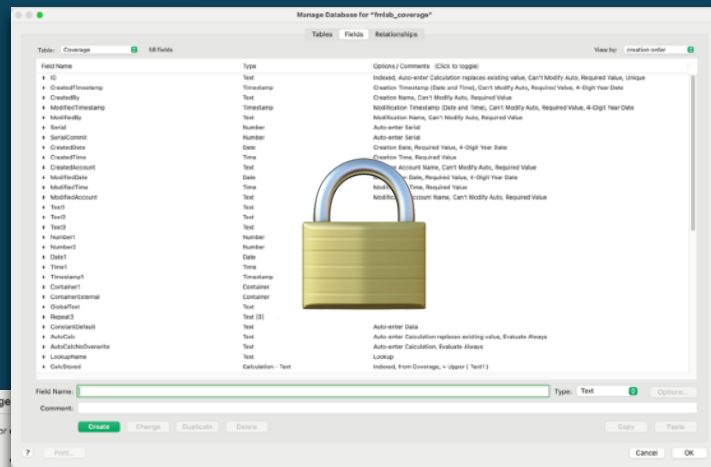
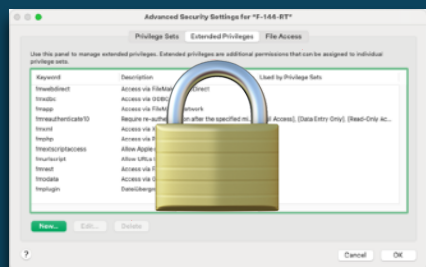
Inherent Logic

Restrictions

Representation



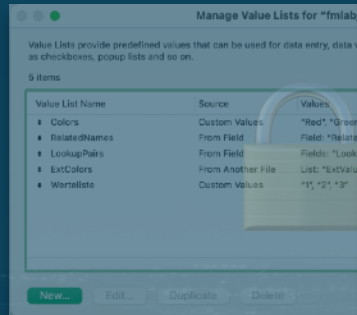
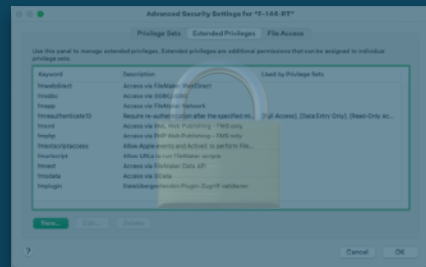
Meaning



Representation



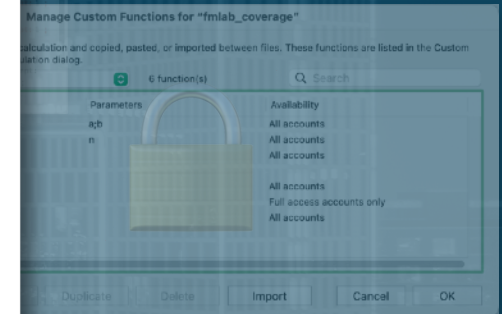
Meaning

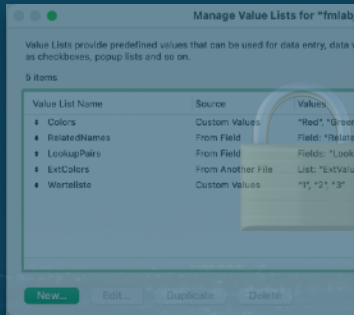


```
Script Workspace (Einstellungen) MBS Search

hole Secret [Service]

1 Set Variable [ $Service ; Value: _ScriptParameter ( 1 ) ]
2
3 Set Variable [ $json ; Value: "" ]
4
5 If [ $Service <> "" ]
6     Freeze Window
7     Go to Layout [ "Secrets" (Secrets) ; Animation: None ]
8     Set Error Capture [ On ]
9     Perform Find [ Restore ]
10    If [ Get ( FoundCount ) = 1 ]
11        Set Variable [ $json ; Value: Let ( [ data = "{}"; data = JSONSetElement ( data ; "ident... ]
12    End If
13    Go to Layout [ original layout ; Animation: None ]
14 End If
15
16 Exit Script [ Text Result: $json ]
```





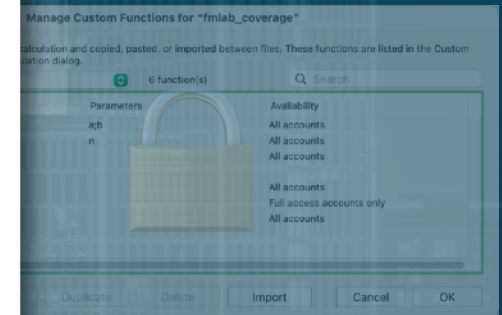
Script Workspace (Einstellungen)

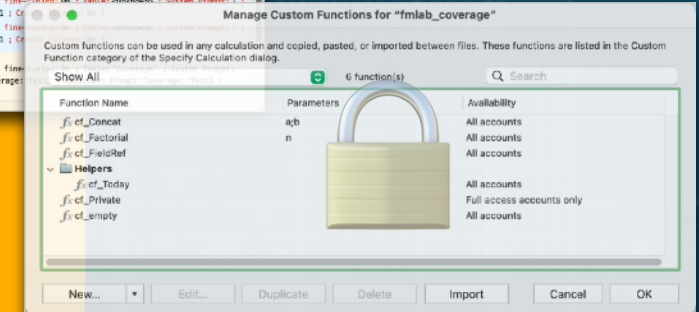
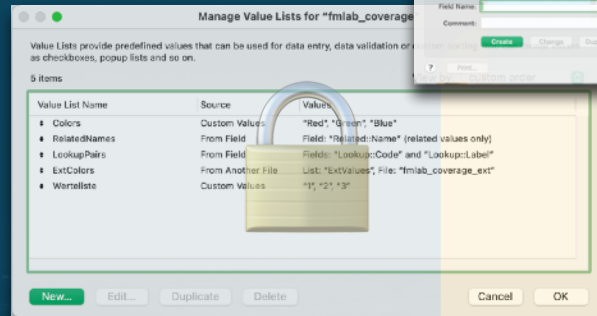
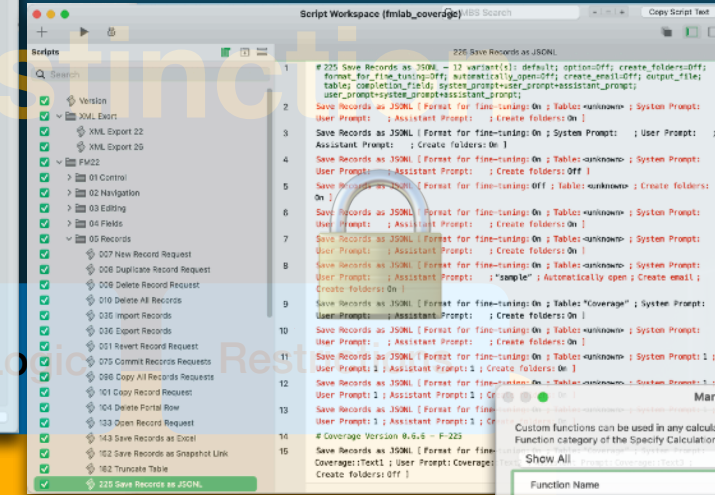
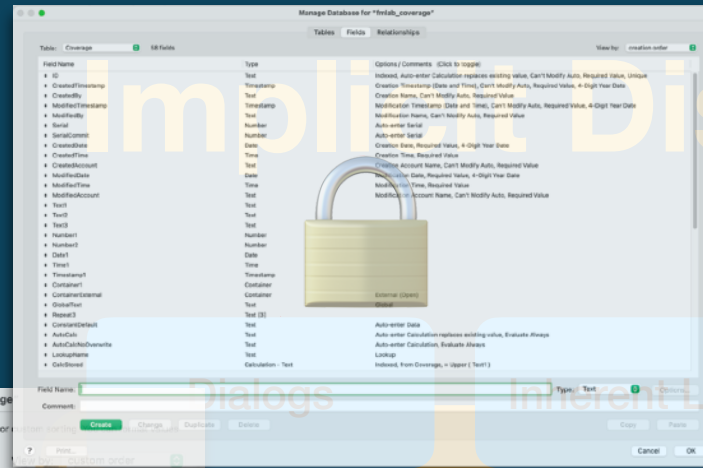
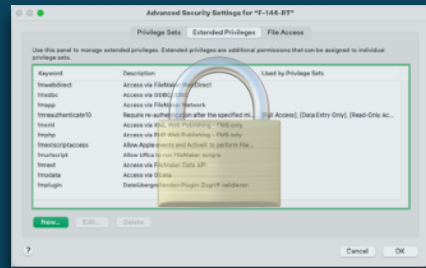
hole Secret [Service]

```
1 Set Variable 141 e ; Value: _ScriptParameter ( 1 ) ]
2 Set Variable 141 Value: "" ]
3
4
5 If 68 e <> "" ]
6 Freeze Window 79
7 Go to Layout 6 ts" (Secrets) ; Animation: None ]
8 Set Error Capture 86
9 Perform Find 28 e ]
10 If 68 oundCount ) = 1 ]
11 Set Variable 141 Value: Let 257 = "{}"; data = JSONSetElement 242 "ident... ]
12 End If 70
13 Go to Layout 6 al layout ; Animation: None ]
14 End If 70
15
16 Exit Script 103 sult: $json ]
```

Script text is for humans only 

Code is stored as tokens by ID





Representation

Meaning

A Field "Summary" is set by a Script "Show Results" to sum up the values of Field "Amount" and displayed in a Layout "Report"

API?

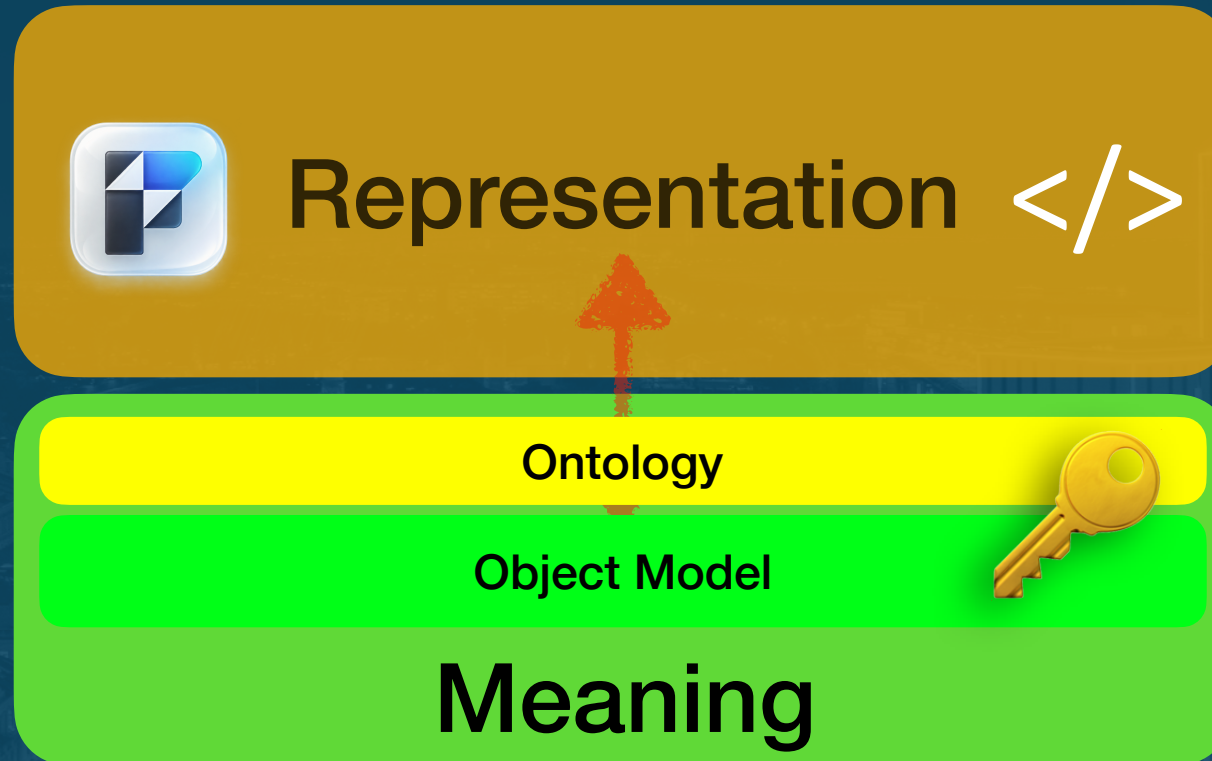
Under the Hood

Representation



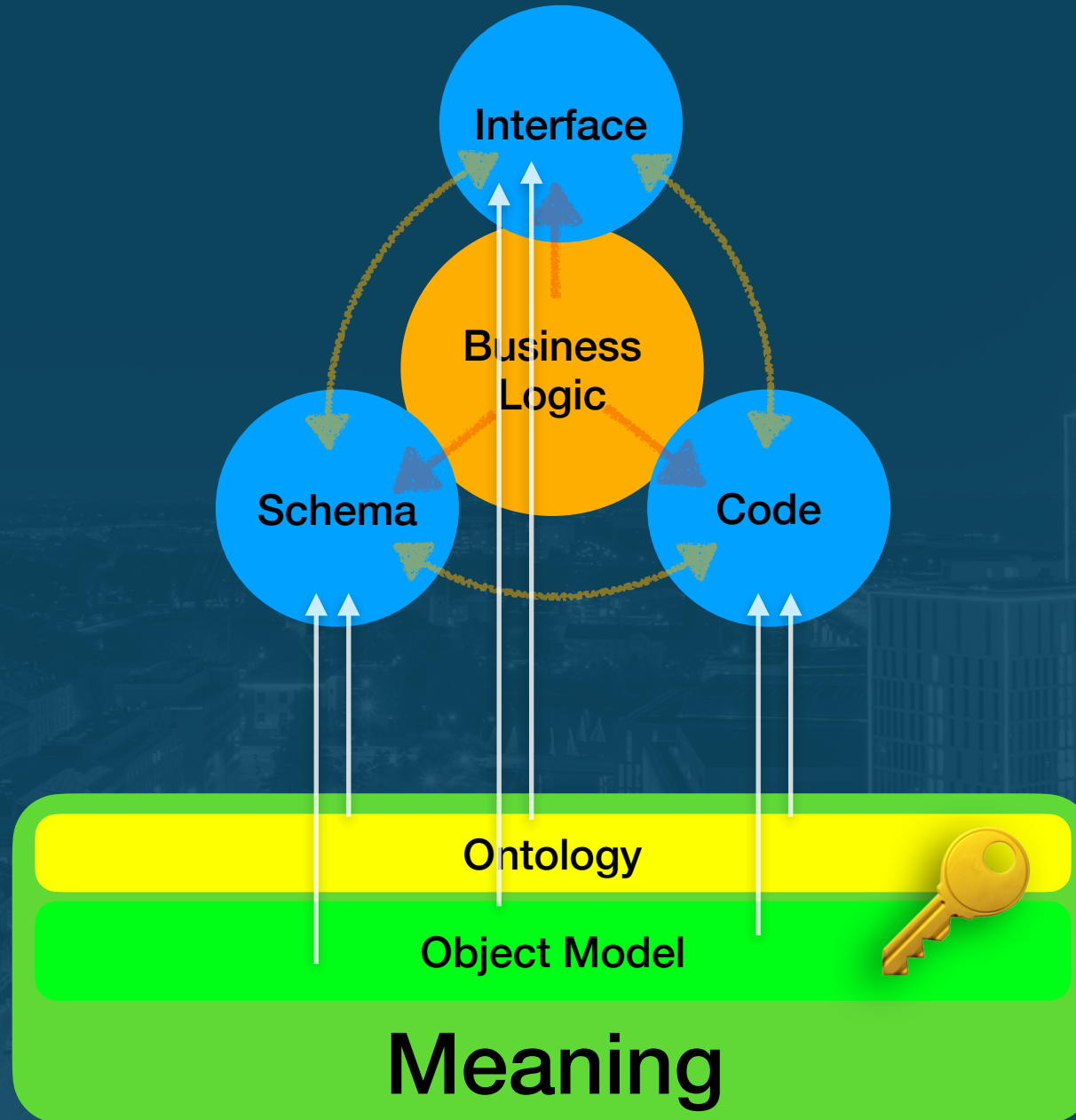
Meaning

Under the Hood



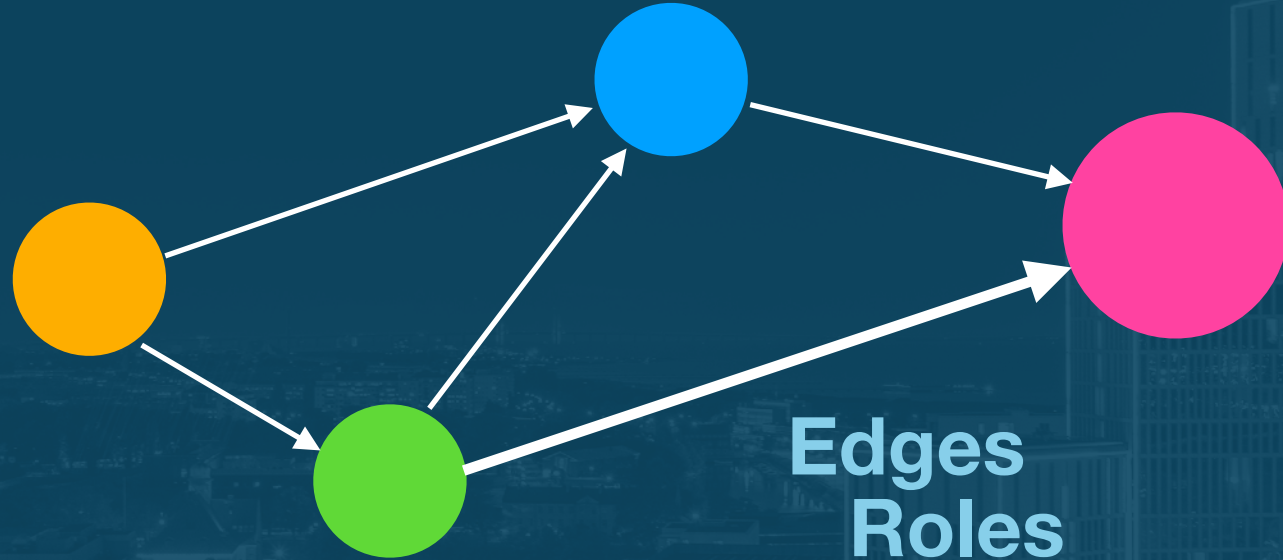
Everything is a Graph

following
implicit rules

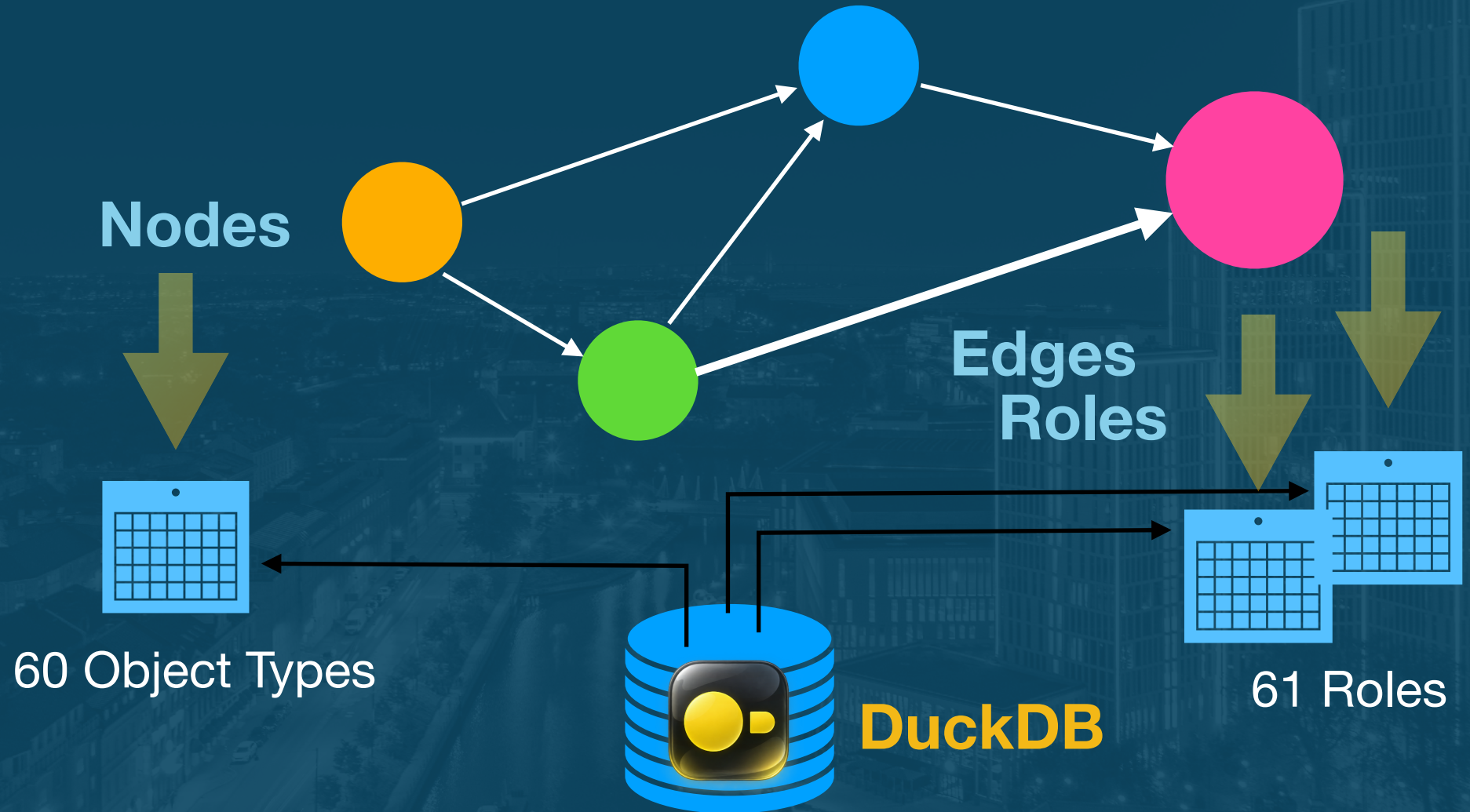


Everything is a Graph

Nodes



Everything is a Graph



A specialized Tool

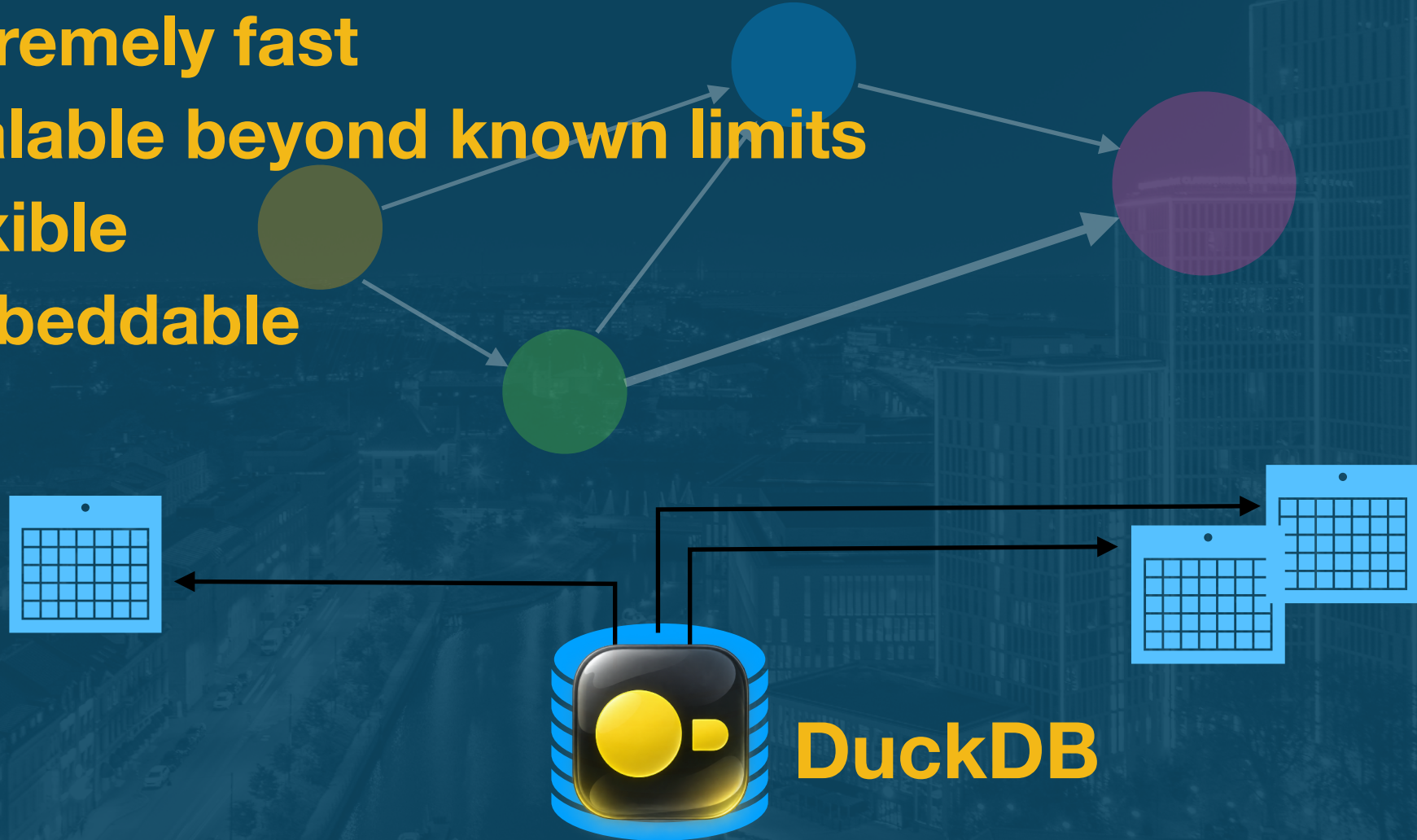
analytical engine

extremely fast

scalable beyond known limits

flexible

embeddable



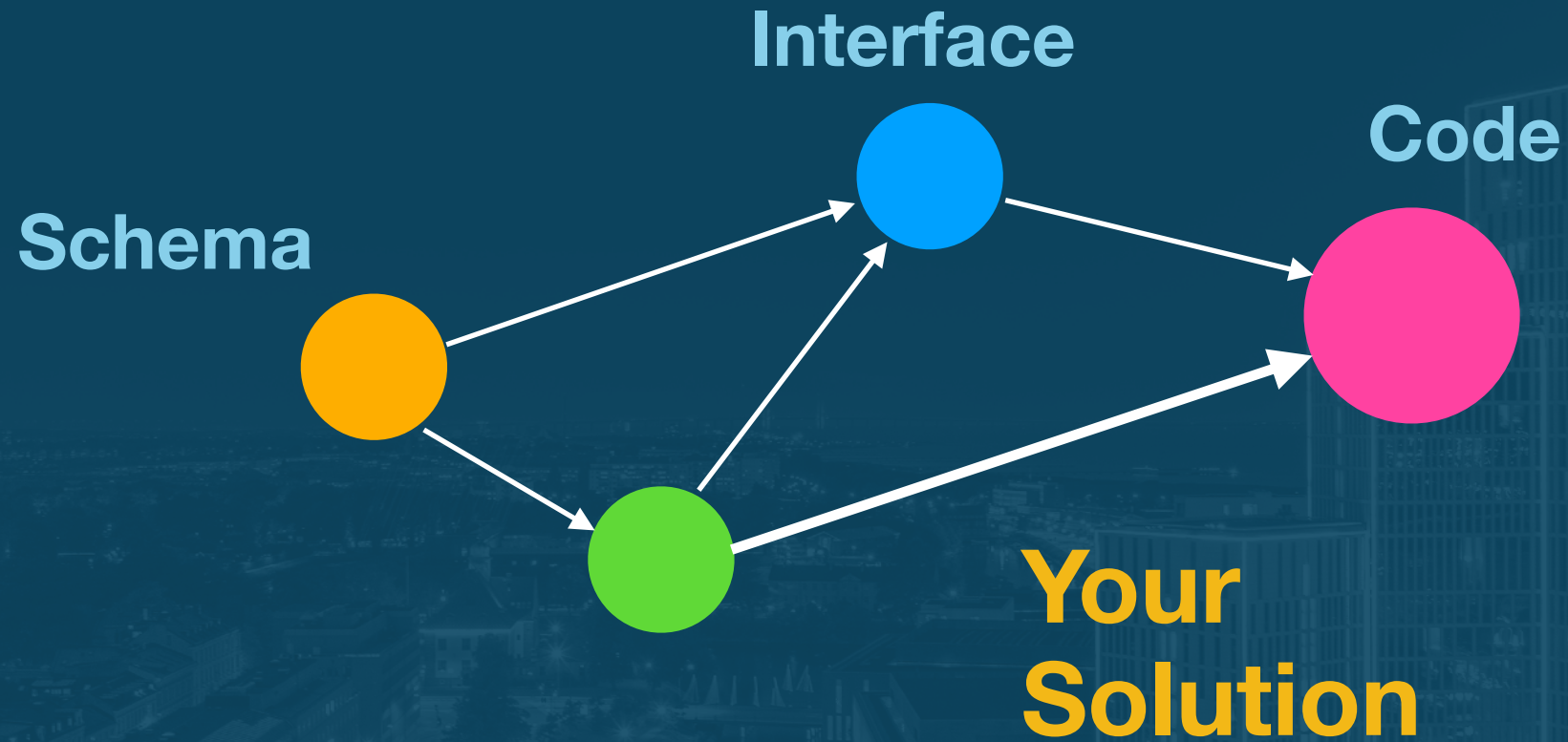


An aerial night view of a city, likely London, featuring a river (the Thames) flowing through the center. On the right side, several modern, illuminated skyscrapers stand out against the dark sky. The city lights are visible in the background, and the overall scene is bathed in a blue light. The text 'Connecting the dots' is overlaid in a large, bold, yellow font, and 'how Agents see the World' is overlaid in a smaller, white font below it.

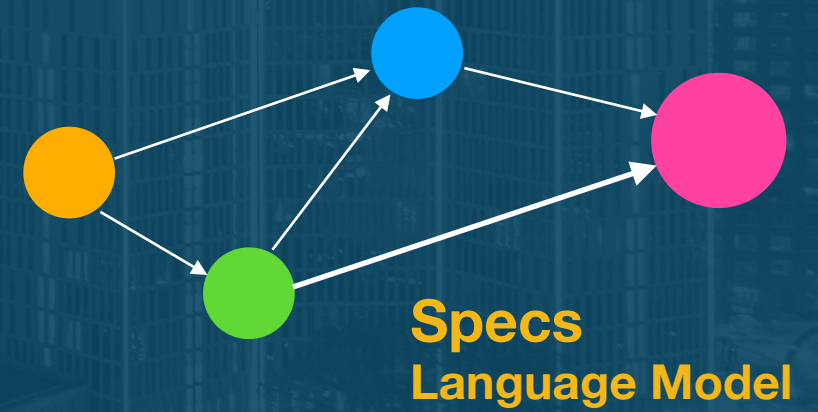
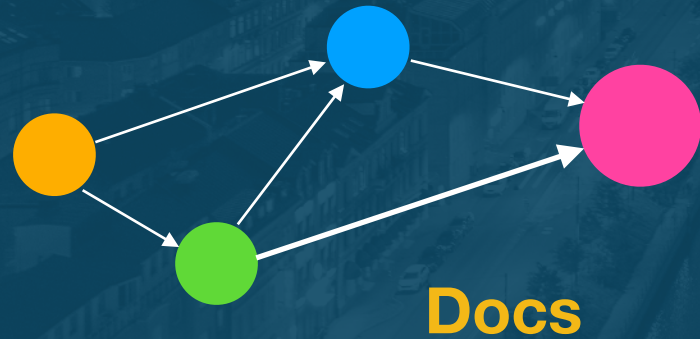
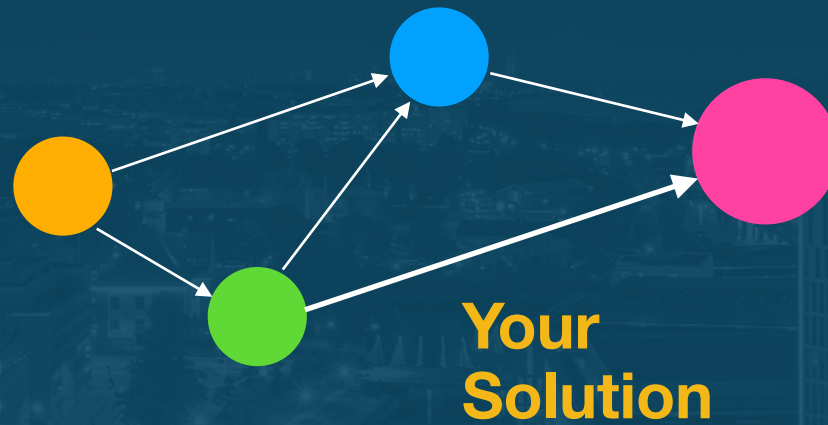
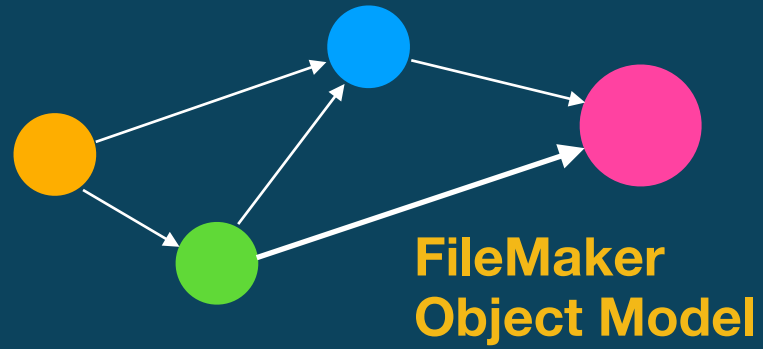
Connecting the dots

how Agents see the World

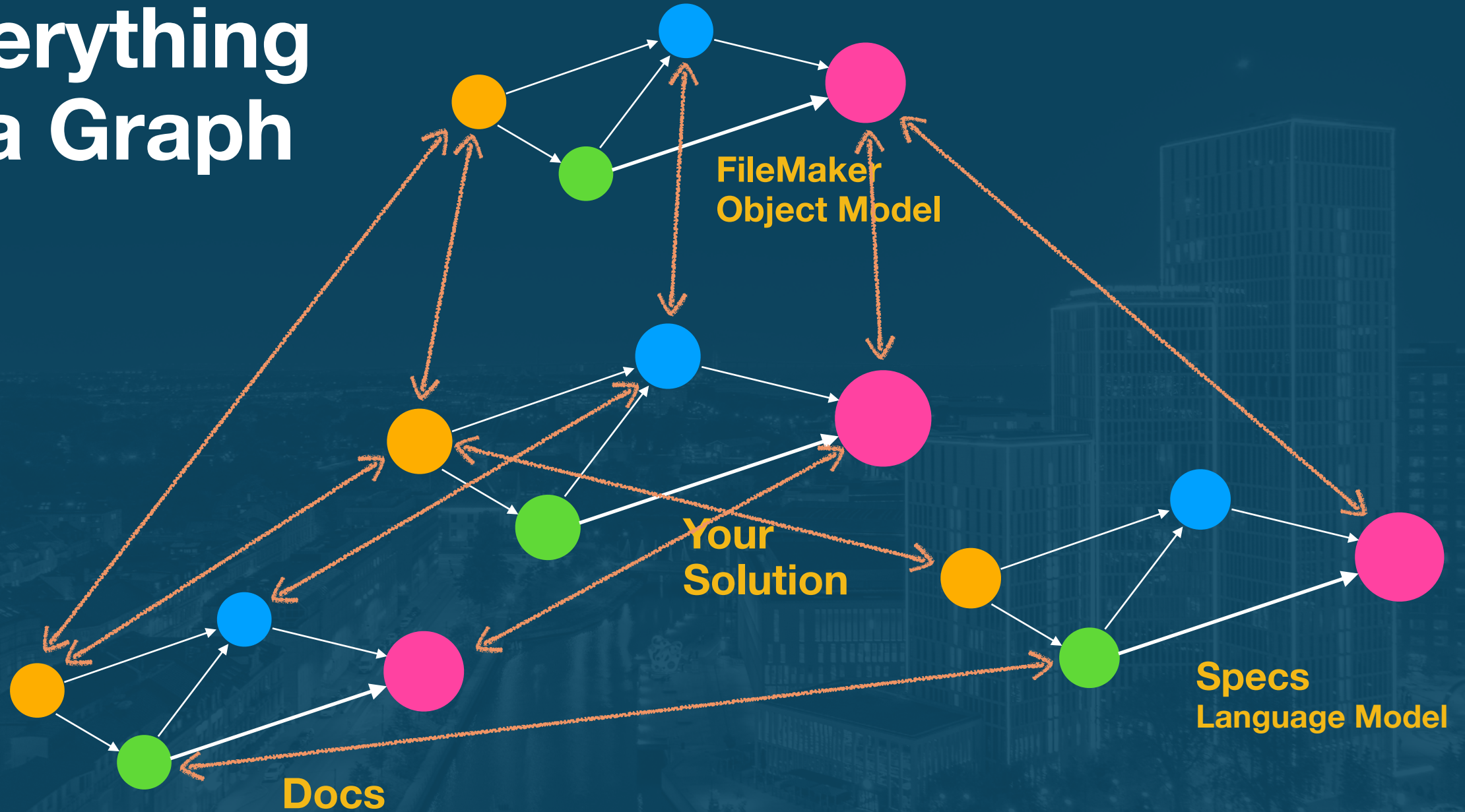
Everything is a Graph



Everything is a Graph



Everything is a Graph



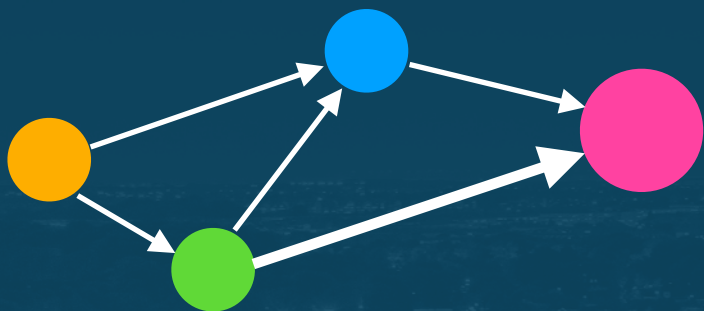


An aerial night view of a city, likely London, featuring a river (the Thames) flowing through the center. On the right side, several modern, illuminated skyscrapers stand out against the dark sky. The city lights and buildings are visible in the background, creating a vibrant urban scene.

More superpowers

Intelligence at its best

Let's bring in more intelligence



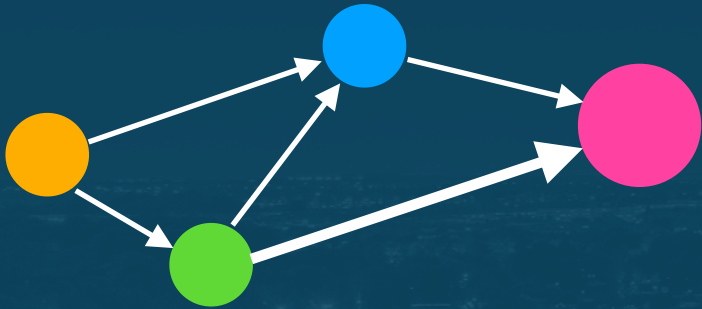
Structure



Language Model



Let's bring in more intelligence



Structure



SQL

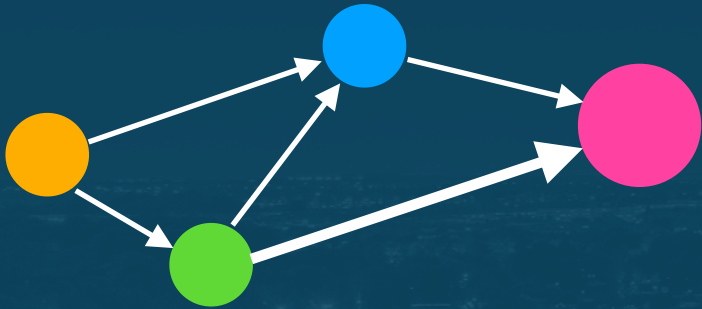
Queries!



Language Model



Let's bring in more intelligence



Structure

Structure



SQL

Queries!

Queries!



Language Model

Language Model



SQL

50+ years track record
well understood by LLMs
ask anything that could be codified
directed queries
precise answers
Token effective!





An aerial night view of a city, likely Copenhagen, featuring a river (Nørrebro) and several modern skyscrapers (The Circle, The Circle II, and The Circle III) illuminated against a dark sky. The foreground shows a mix of older residential buildings and modern architecture.

Gather meaning

from information to intent

Raw power won't help ...

LLM



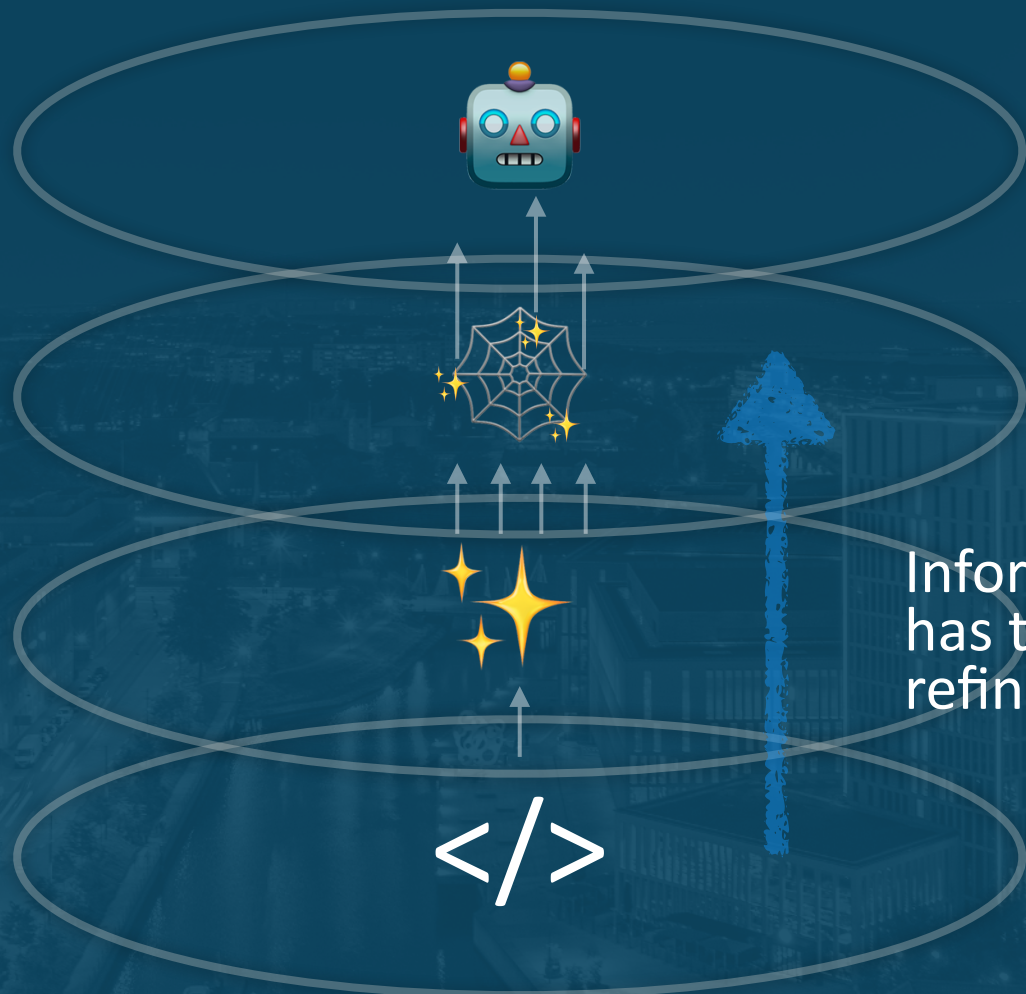
Markdown
Text

no meaningful
structure

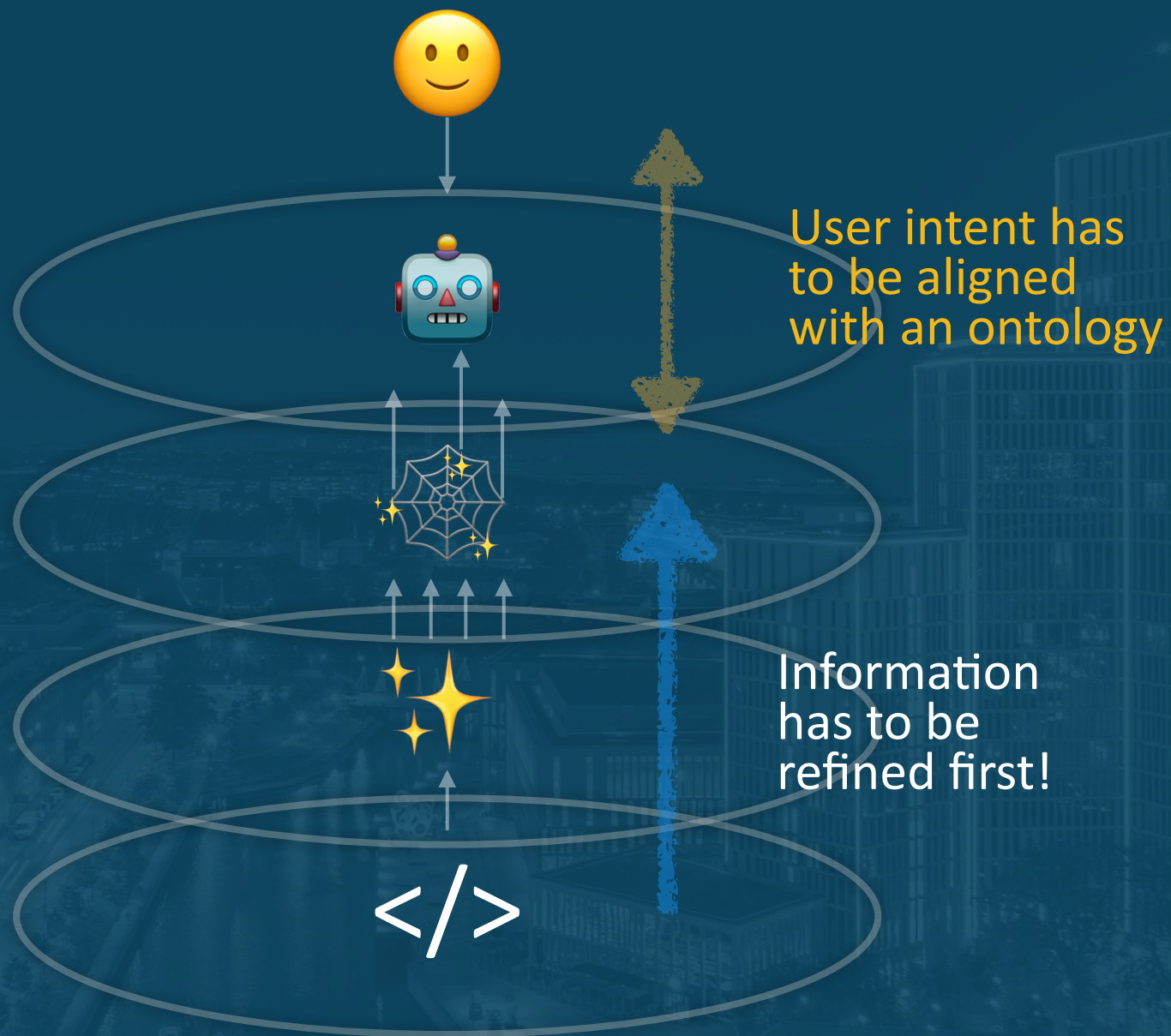


XML

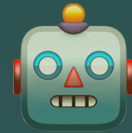
</>



Information
has to be
refined first!



Interaction Layer



User intent has to be aligned with an ontology

Ingestion Pipeline



Information has to be refined first!

Insights



Descriptions
Patterns · Rules

Semantic Signals



File names
Schema names
Script names
Variable names
Comments

Graph



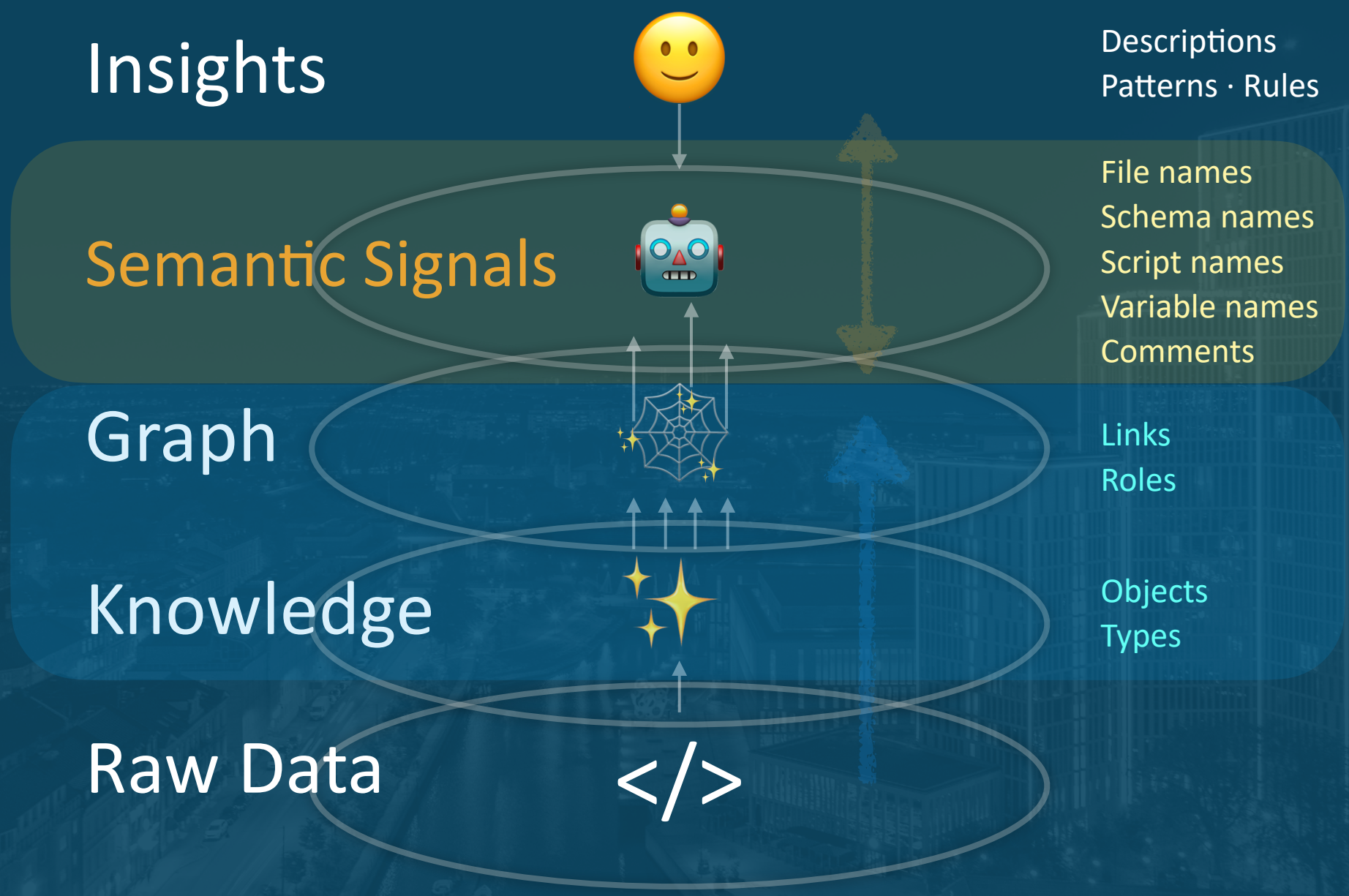
Links
Roles

Knowledge



Objects
Types

Raw Data



User Intent



API + LLM



Links



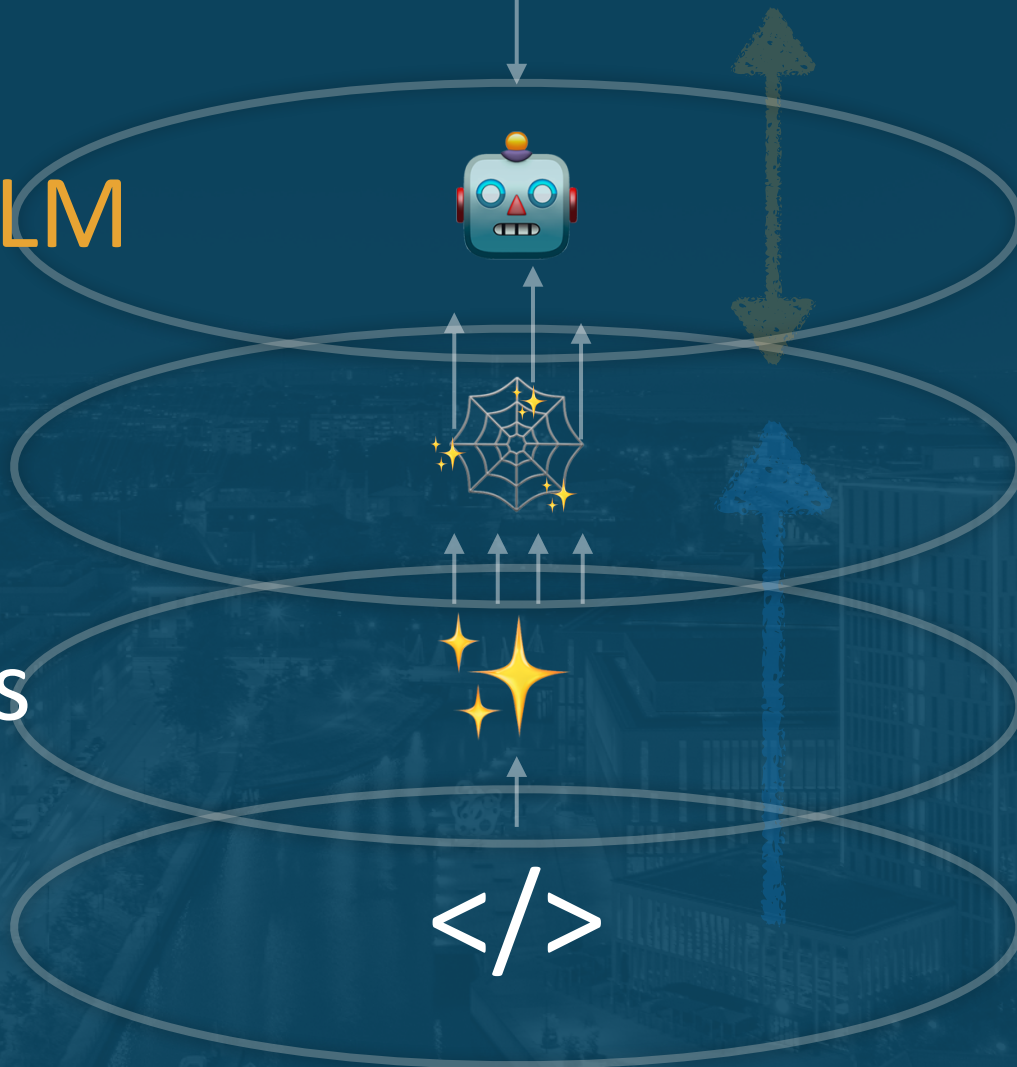
Objects



XML



**Harness
stack**



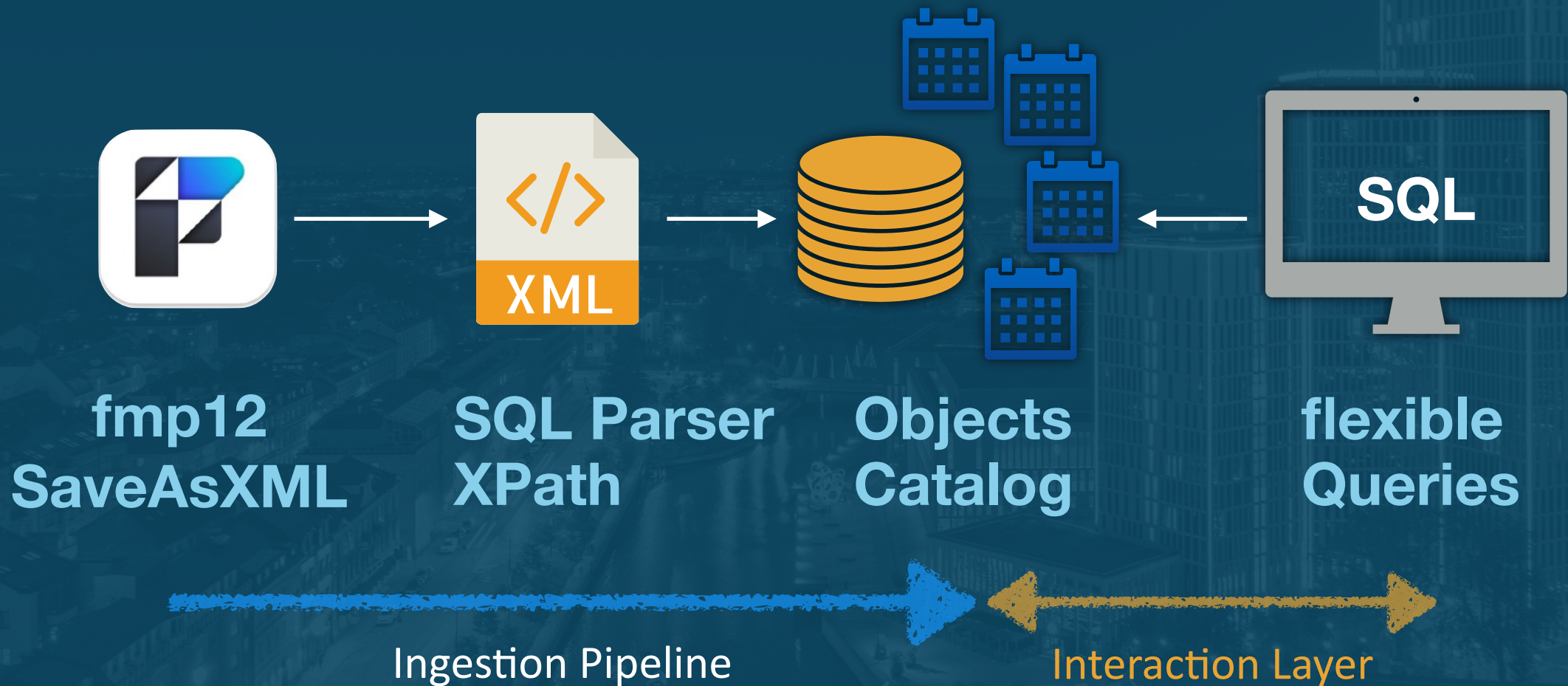


An aerial night view of a city, likely Copenhagen, featuring a river (Nørrebro) and a cluster of modern, illuminated skyscrapers on the right. The city lights and water reflections create a vibrant scene against the dark sky.

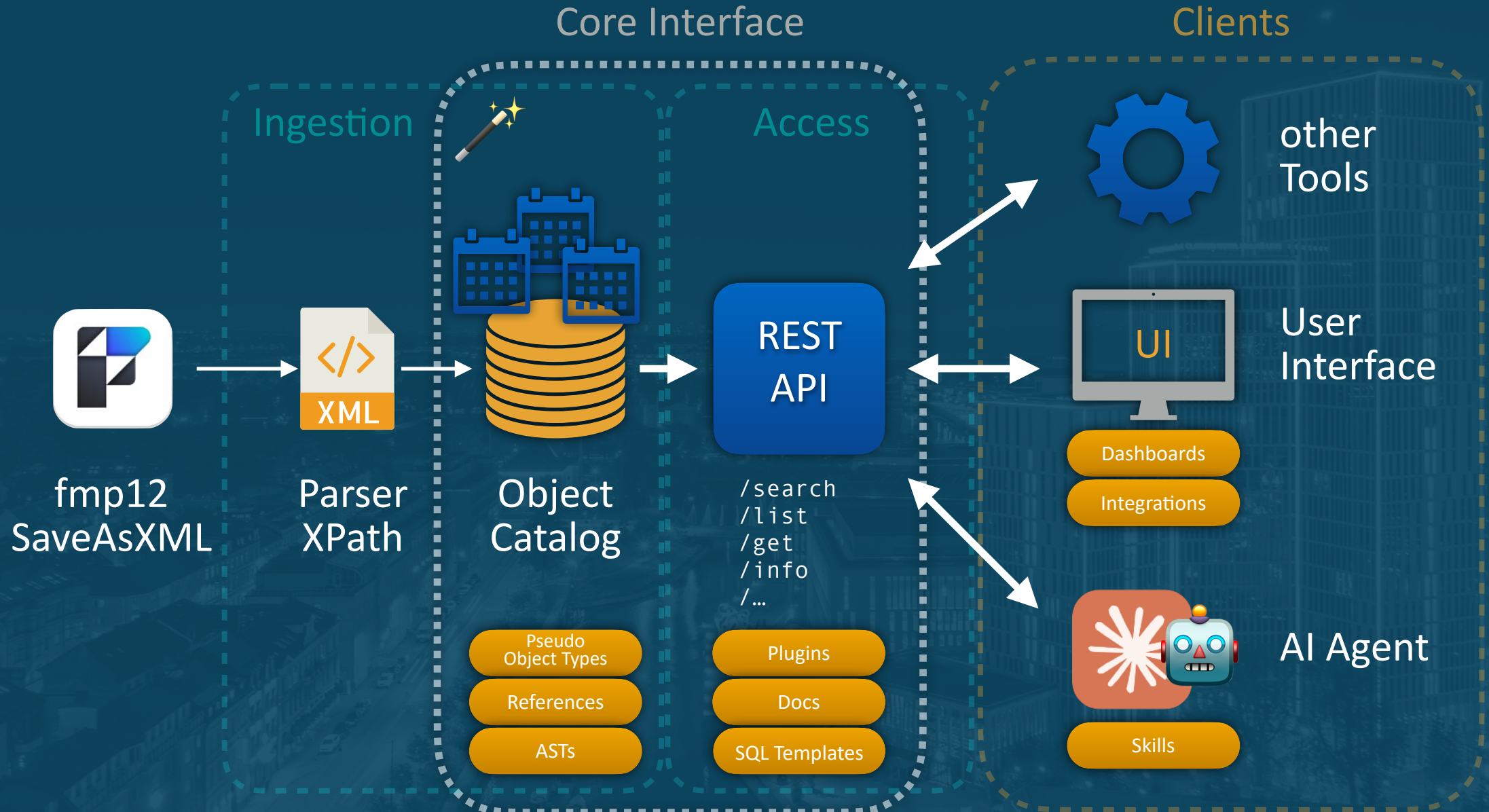
Foundation

A sophisticated architecture that lasts

Architecture

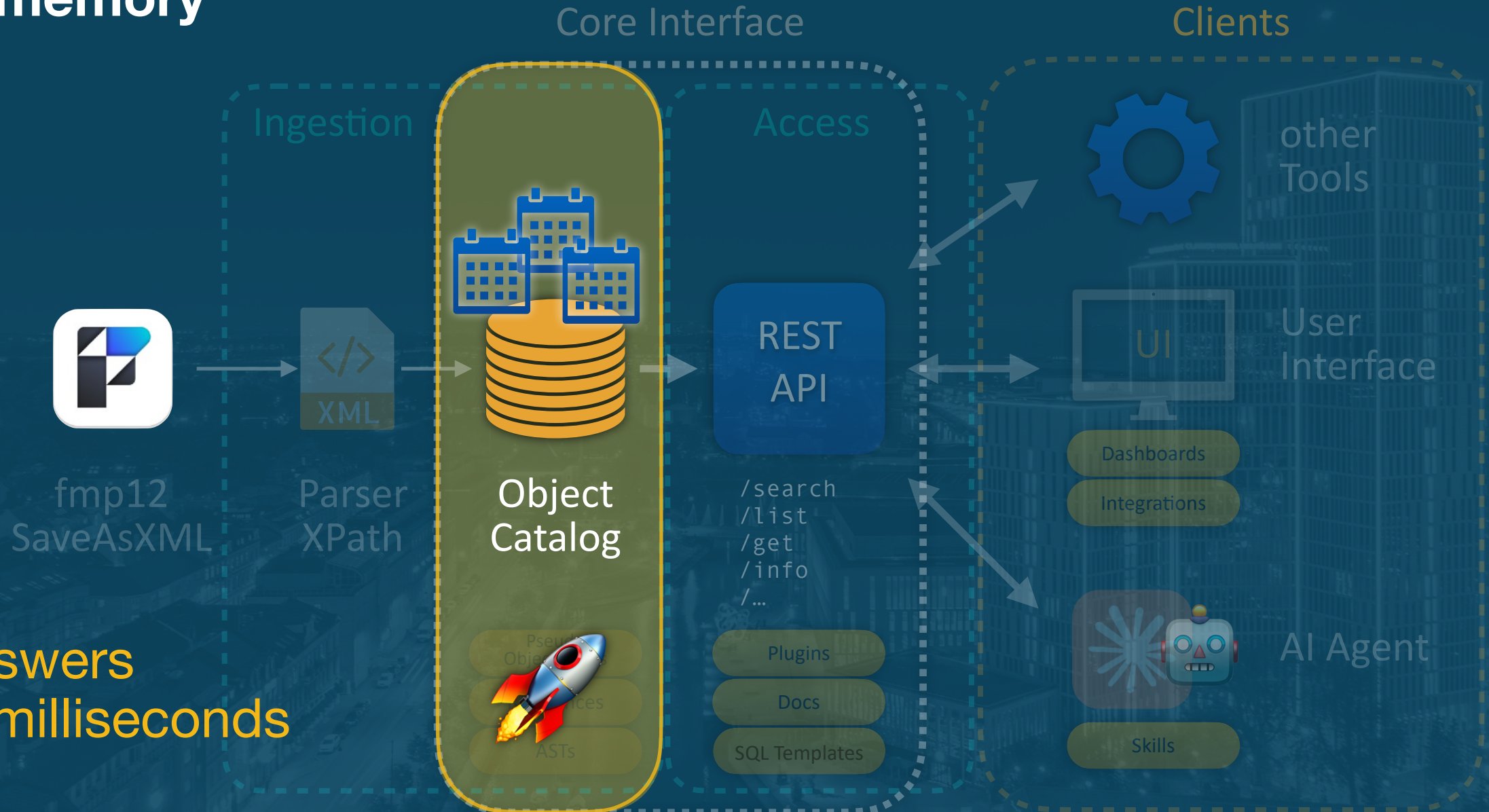


Architecture



Digital twin in memory

answers
in milliseconds



API abstraction

distributed
access

Core Interface

Clients



fmp12
SaveAsXML



Parser
XPath



Object
Catalog

- Pseudo Object Types
- References
- ASTs

REST
API

/search
/list
/get
/info
/...

- Plugins
- SQL Templates



other
Tools



User
Interface

Dashboards

Integrations

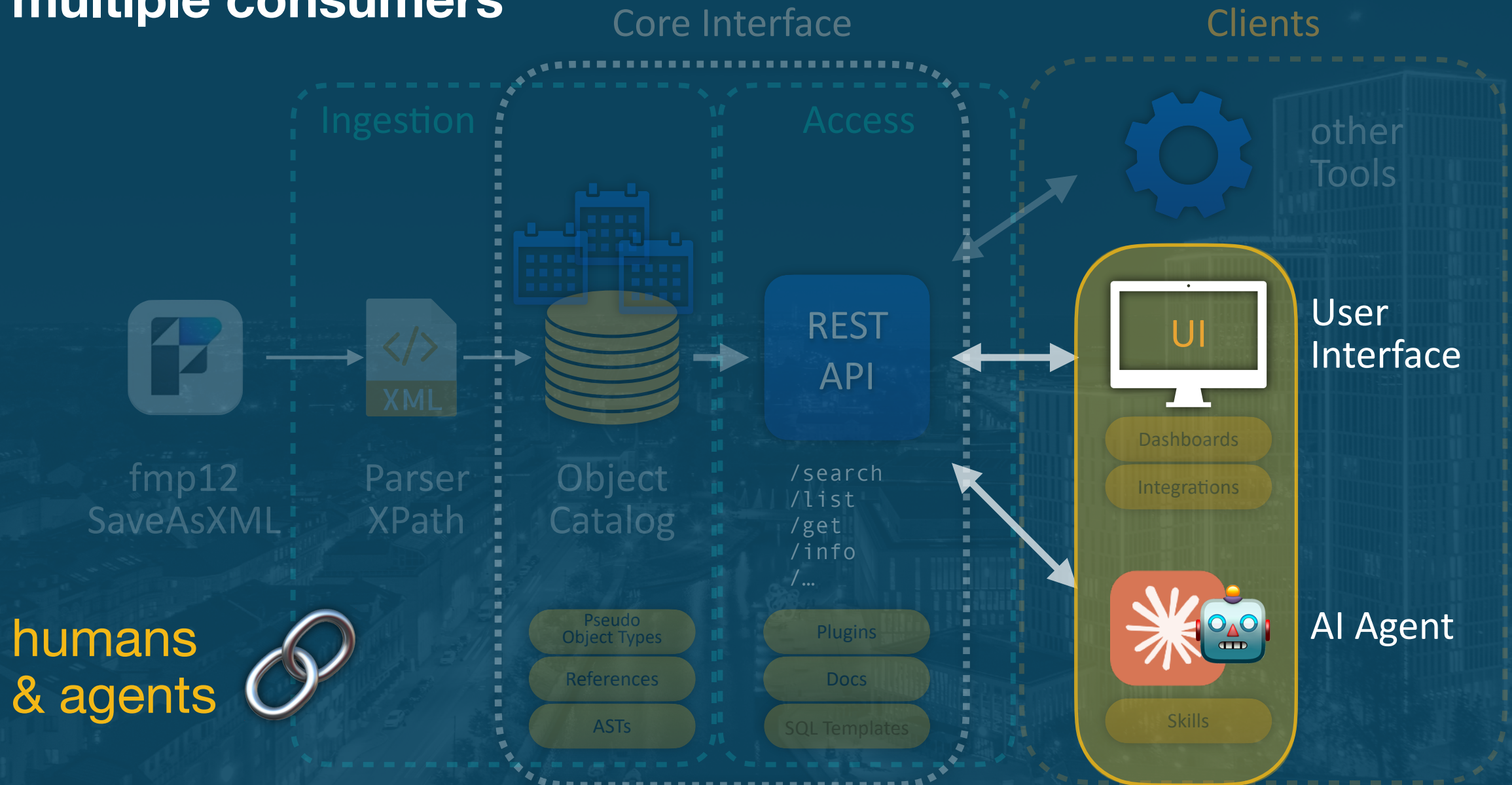


AI Agent

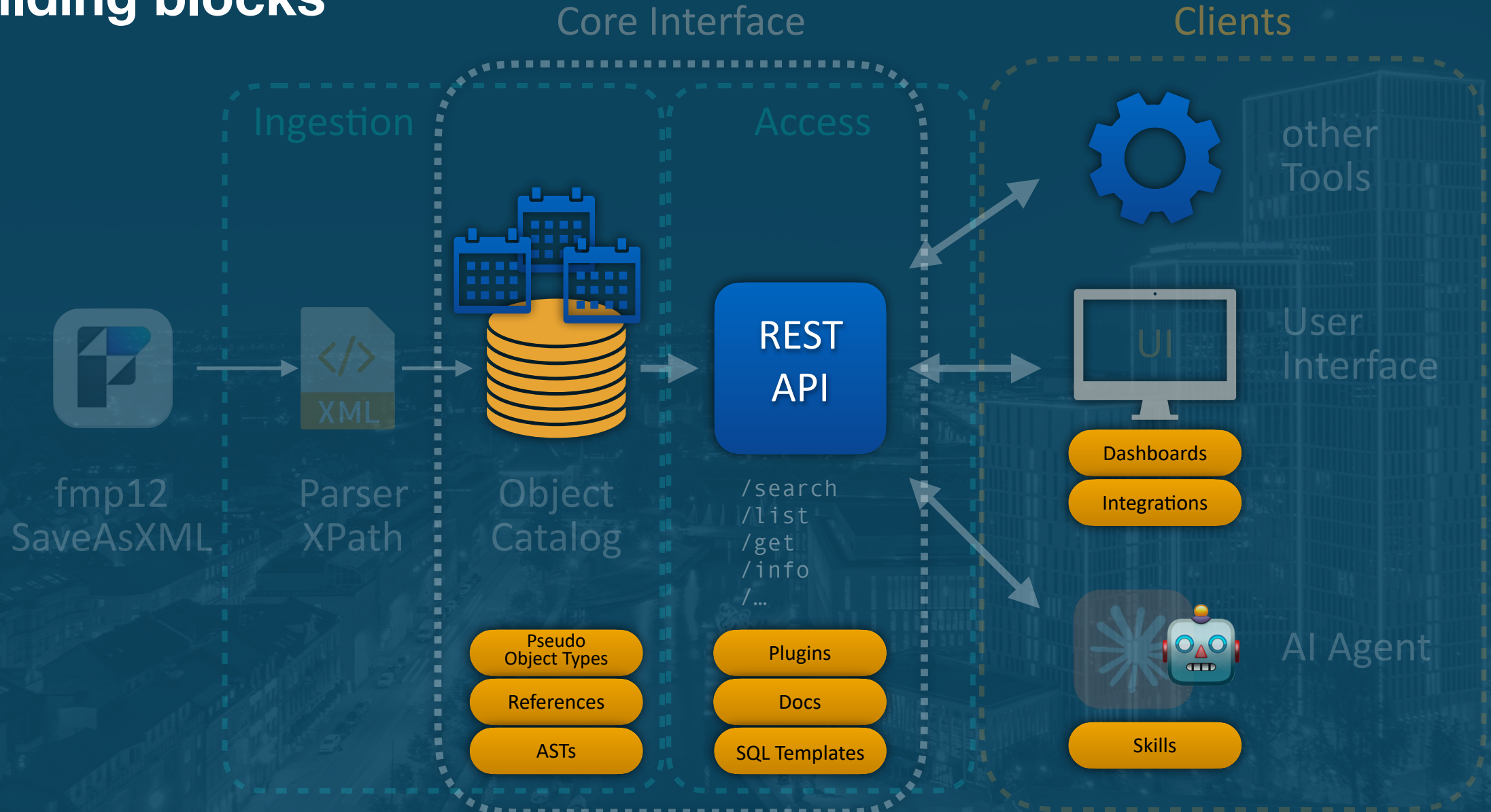
Skills

Action layer

multiple consumers



composable + extendable building blocks





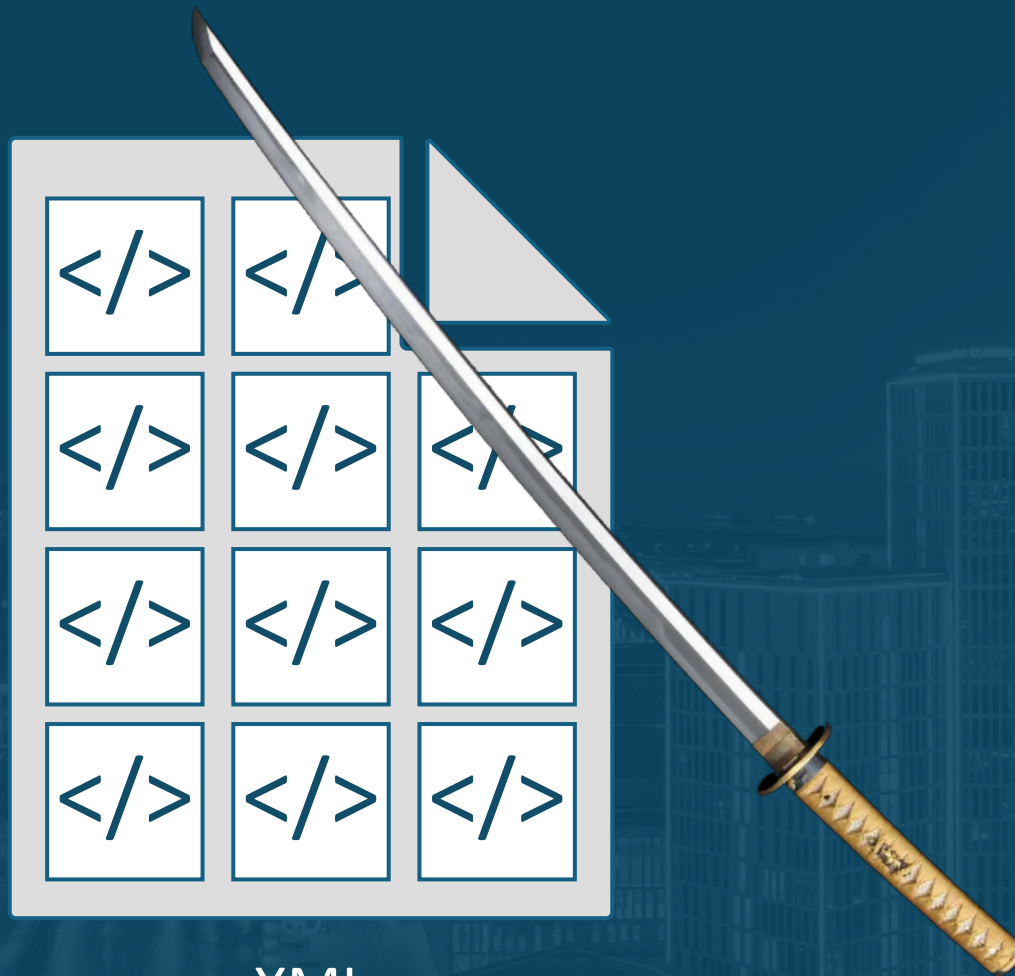
An aerial night view of a city, likely London, featuring a river (the Thames) flowing through the center. The city is illuminated by streetlights and building lights. On the right side, several modern, tall skyscrapers with glass facades are prominent, reflecting the city lights. The overall scene is a mix of historic architecture and modern urban development.

Katana

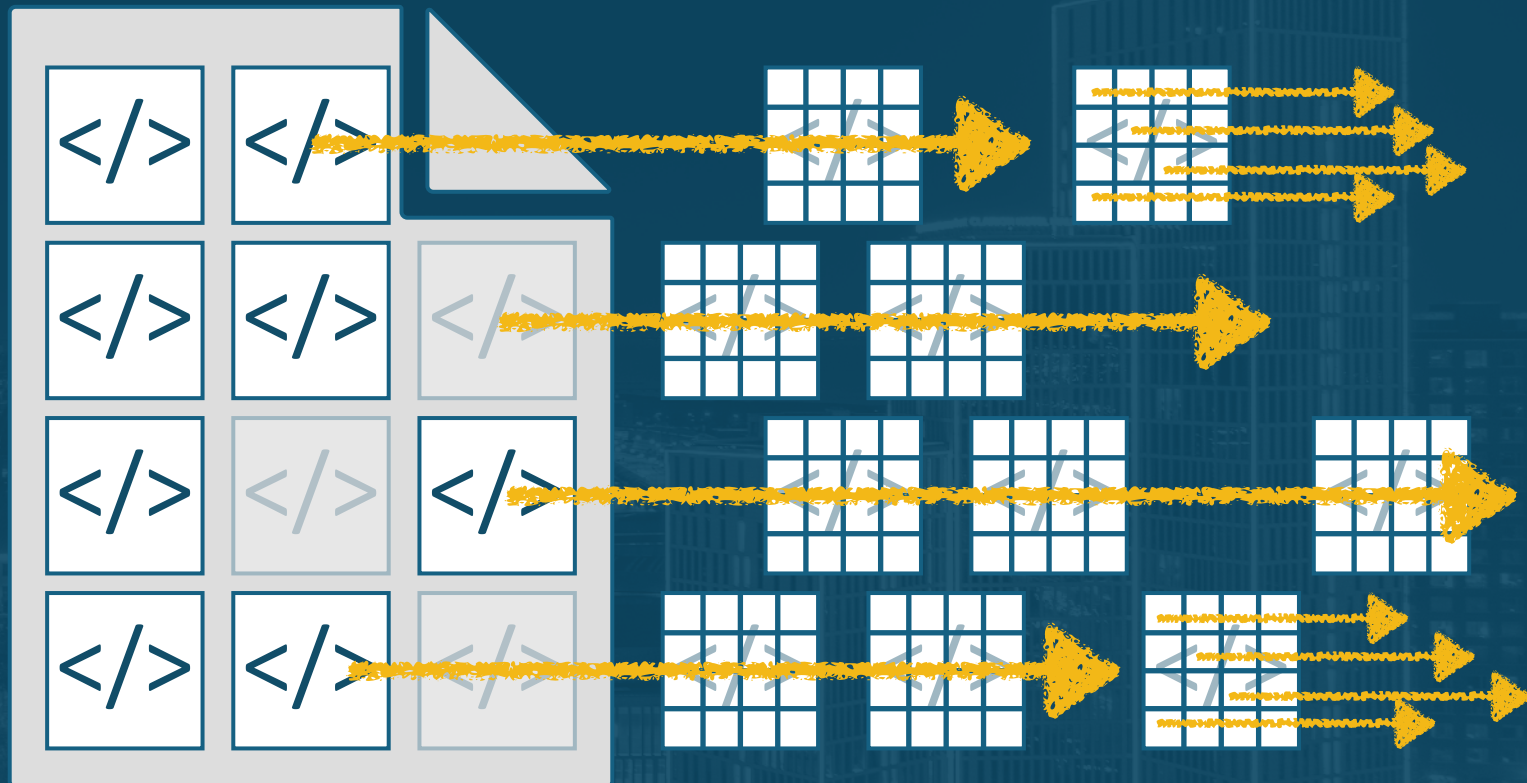
high speed high volume parallelism



XML



XML

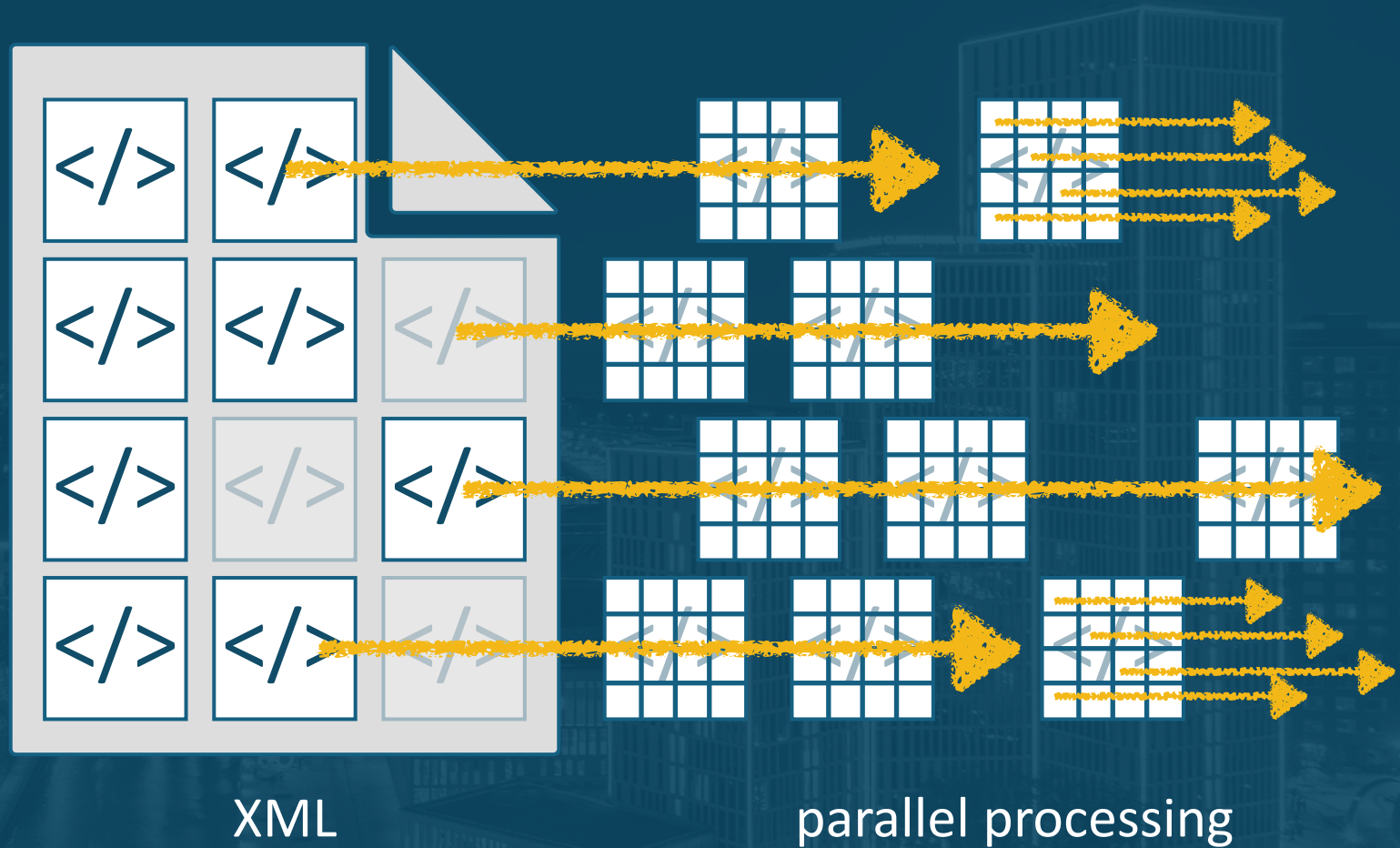


XML

small chunks

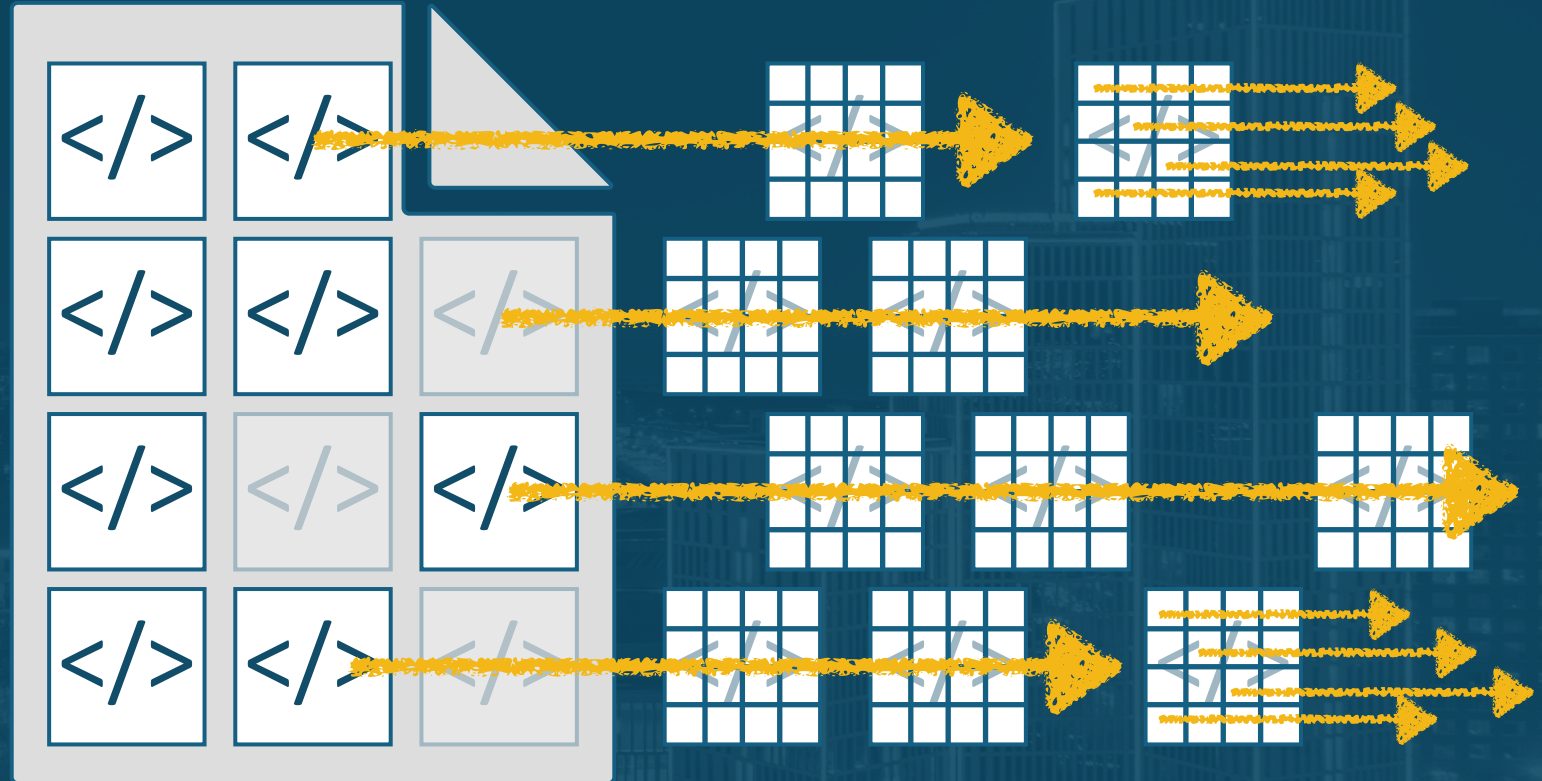
Katana XML engine

granular Hash Map
auto configuration
low memory profile
max CPU usage
multiple workers
DOM parsing
SAX streaming



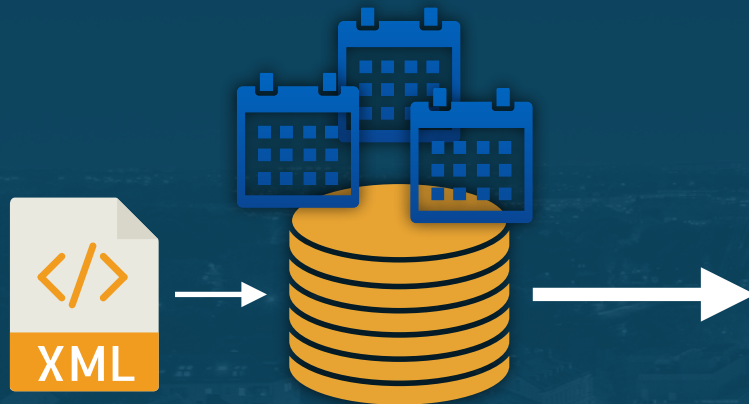
Katana XML engine

from multiple hours
to minutes



XML

Schema



Parser
XPath

Object type
Catalogs

name varchar
AccountsCatalog
BaseDirectoryCatalog
BaseTableCatalog
CalcsForCustomFunctions
CustomFunctionsCatalog
CustomMenuCatalog
DDR_Calculations
DDR_ScriptSteps
ExtendedPrivilegesCatalog
ExternalDataSourceCatalog
FieldsForTables
FilesCatalog
LayoutObjects
LayoutParts
Layouts
ObjectCatalog
ObjectLinks
OptionsForValueLists
PasteIndexList
PrivilegeSetsCatalog
RelationshipCatalog
ScriptCatalog
ScriptTriggers
StepsForScripts
TableOccurrenceCatalog
ThemeCatalog
ValueListCatalog
VariableUsages
VariablesCatalog
XMLLayoutReferences
XMLMetadata
XMLStepReferences
v_cross_file_dependencies
v_link_stats
v_object_stats

Unified Object catalog



ObjectCatalog

Object_UUID	varchar
Object_Type	varchar
Object_Name	varchar
File_Name	varchar
Source_Table	varchar
Object_ID	bigint

Nodes

ObjectLinks

Source_UUID	varchar
Source_Type	varchar
Target_UUID	varchar
Target_Type	varchar
Link_Type	varchar
Link_Role	varchar
Source_File	varchar
Target_File	varchar
Is_Cross_File	boolean

Edges
Roles

Unified Object catalog

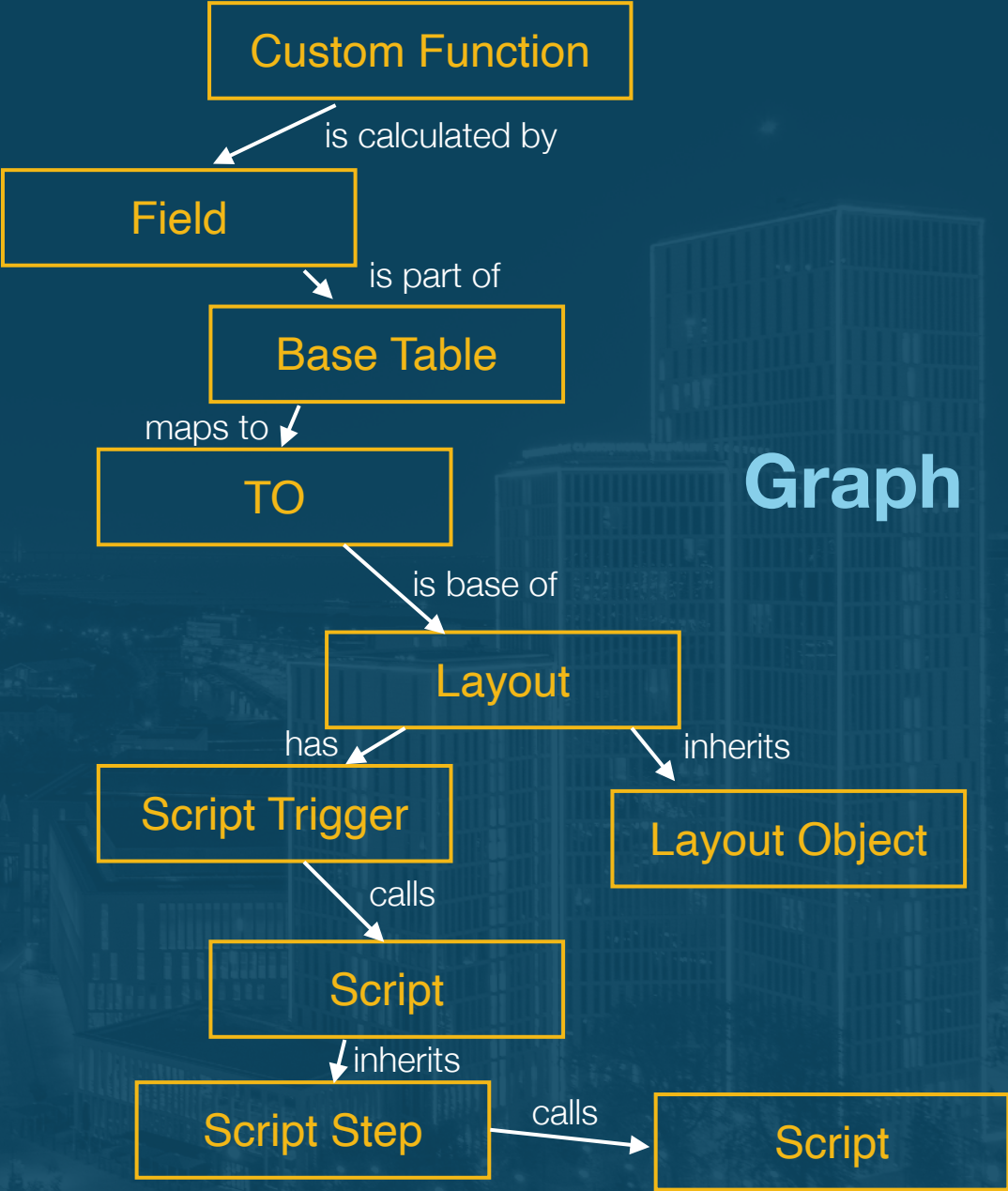


Nodes

Edges Roles

ObjectCatalog	
Object_UUID	varchar
Object_Type	varchar
Object_Name	varchar
File_Name	varchar
Source_Table	varchar
Object_ID	bigint

ObjectLinks	
Source_UUID	varchar
Source_Type	varchar
Target_UUID	varchar
Target_Type	varchar
Link_Type	varchar
Link_Role	varchar
Source_File	varchar
Target_File	varchar
Is_Cross_File	boolean



PROJECT SILVERFANG

ASTON MARTIN DB5 SPECIAL OPERATIONS EDITION

SPECIFICATIONS

ENGINE	4.0 L I6 (MOD)
POWER	325 kW
TORQUE	550 Nm
0 - 100 km/h	4.8 s
TOP SPEED	270 km/h
ARMOR	COMPOSITE
SYSTEMS	Q-BRANCH

EJECTOR SEAT

REAR DEFENCE SHIELD

ROOF HATCH



BUILT FOR
A HIGHER PURPOSE.

HIDDEN WEAPONS



WHEEL BLADES

OIL DISPERSAL

MACHINE GUNS

RETRACTABLE BUMPERS

SMOKE SCREEN



An aerial night view of a city, likely New York City, featuring a river (Hudson River) and several modern skyscrapers, including the Freedom Tower. The image is dark blue with the text overlaid.

fm-specs

a blueprint for FileMaker coding

FileMaker Specs

machine readable
database driven
rule bound

- script steps
- functions
- triggers
- error codes
- locales

SKANDIX / fm-spec

English

← Back

fm-spec
Schema viewer for the generative reference

SCHEMA	FM VERSION (SHAPES)	FM VERSION (DOCS)	BUILT AT	SCRIPTSTEPS	FUNCTIONS
2.9.0	22 · 26	26	9/16/2026	216	375
LOCALES	GRAMMAR COVERAGE	TRIGGERS	ERROR CODES		
11 / 11	232/216 steps	26	294		

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ScriptSteps

Functions

Triggers

Error Codes

Locales

216 / 216

All platforms

Filter...

STEP ID	NAME (EN)	CATEGORY ID	CATEGORY	ORIGIN VERSION	GRAMMAR
1	Perform Script	1	Control script steps	6.0 or earlier	YES
3	Save a Copy as XML	8	Files script steps	18.0	YES
4	Go to Next Field	2	Navigation script steps	6.0 or earlier	YES
5	Go to Previous Field	2	Navigation script steps	6.0 or earlier	YES
6	Go to Layout	2	Navigation script steps	6.0 or earlier	YES
7	New Record/Request	5	Records script steps	6.0 or earlier	YES
8	Duplicate Record/Request	5	Records script steps	6.0 or earlier	YES
9	Delete Record/Request	5	Records script steps	6.0 or earlier	YES
10	Delete All Records	5	Records script steps	6.0 or earlier	YES
11	Insert from Index	4	Fields script steps	6.0 or earlier	YES

FileMaker Specs

Metadata

ID

minimal version

platform compatibility

platform exclusive

depreciation

help text URL

[SKANDIX](#) / [fm-spec](#) / Perform Script English

[← Back](#)

Perform Script #1 [Claris Help →](#)
Slug: perform-script · Category ID: 1 · Origin version: 6.0 or earlier
Platform compatibility: [FileMaker Pro](#) [FileMaker Server](#) [FileMaker Go \(iOS\)](#) [FileMaker WebDirect](#) [FileMaker Cloud](#) [FileMaker Data API](#) [Custom Web Publishing](#)

Structured parameters

#	NAME	DESCRIPTION
1	Specified:	From list allows you to select the script you want to perform.
2	By name	allows you to specify the script name by a calculation. The script name is not case sensitive.
3	Parameter	specifies a script parameter for the specified script.

XMLSnippet grammar
Shape coverage: [FM 26](#)

SNIPPET TEMPLATE [Copy](#)

```
<Step enable="True" id="1" name="Perform Script">  
  <FileReference id="{file:id}" name="{file:name}">  
    <UniversalPathList>{file:path}</UniversalPathList>  
  </FileReference>  
  <Calculation><![CDATA[{parameter}]]></Calculation>  
  <Script id="{script:id}" name="{script:name}" />  
</Step>
```

Element order: FileReference, Calculated, Calculation, Script
Evidence: paired · 22.0.6

OPTIONS

KEY	TYPE	REQUIRED	LABEL (EN)	XML PATH	EVIDENCE
file	object_ref	—	from file	FileReference	paired
script_name_calc	calculation	—	—	Calculated/Calculation	roundtrip
parameter	calculation	—	Parameter	Calculation	paired
script	object_ref	—	—	Script	paired

NOTATION IMPLICATIONS

FileMaker Specs

Templates

XMLSnippet

SaXML

fmIDE fmJAML

Parameter slots

order

required slots

default values

enums

exceptions

XMLSnippet grammar

Shape coverage:

FM 26

SNIPPET TEMPLATE

Copy

```
<Step enable="True" id="128" name="Perform Find/Replace">
  <NoInteract state="{no_interact|False}" />
  <FindReplaceOperation MatchWholeWords="{match_whole_words|False}" MatchCase="{match_case|False}" WithinOptions="{search_across|All}" />
  <FindCalc>
    <Calculation><![CDATA[{find_calc}]]></Calculation>
  </FindCalc>
  <ReplaceCalc>
    <Calculation><![CDATA[{replace_calc}]]></Calculation>
  </ReplaceCalc>
</Step>
```

Element order NoInteract, FindReplaceOperation, FindCalc, ReplaceCalc

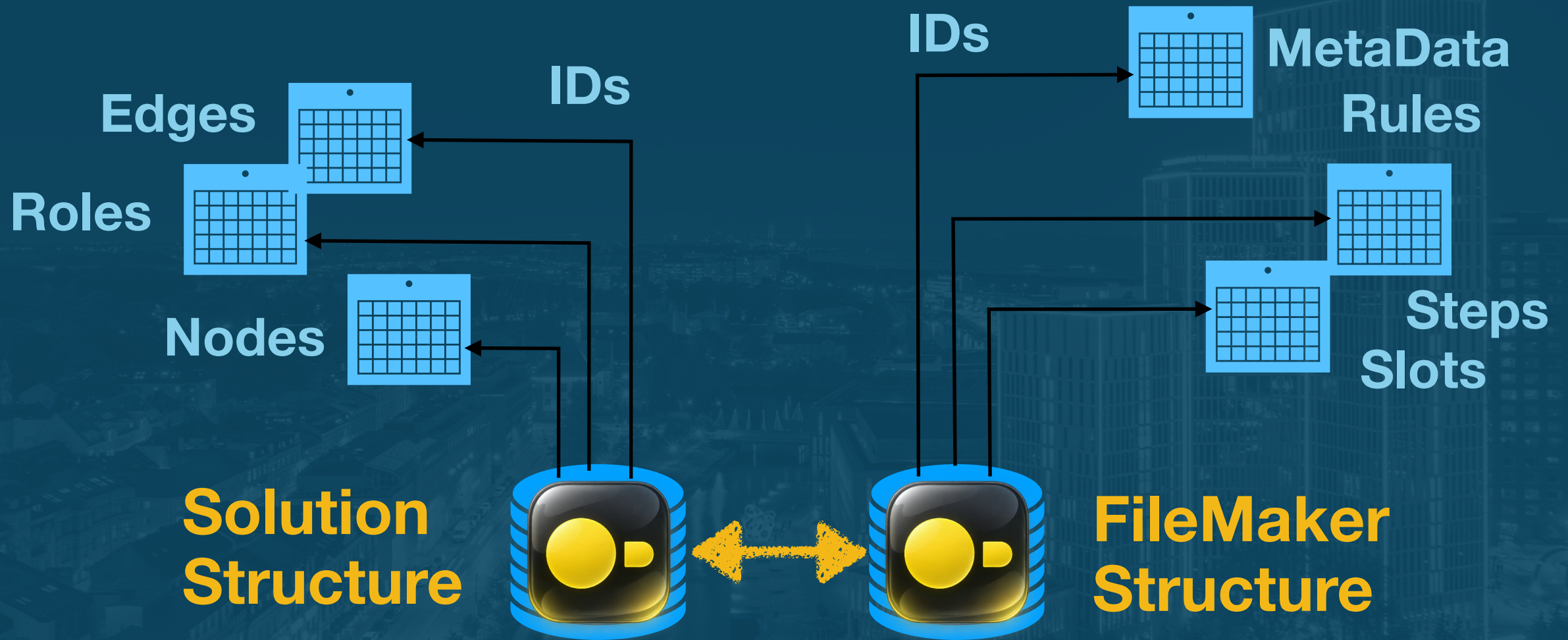
Evidence paired · 22.0.6

OPTIONS

KEY	TYPE	REQUIRED	LABEL (EN)	XML PATH	EVIDENCE
no_interact	boolean	—	With dialog Off → True · On → False	NoInteract/@state	paired
operation	enum Values (4)	✓	Perform	FindReplaceOperation/@type	paired
FindNext			Find Next	roundtrip	
Replace			Replace	roundtrip	
ReplaceAll			Replace All	roundtrip	
ReplaceAndFind			Replace & Find	roundtrip	
find_calc	calculation	—	Find what	FindCalc/Calculation	paired
replace_calc	calculation	—	Replace with	ReplaceCalc/Calculation	paired
direction	enum Values (3)	—	Direction	FindReplaceOperation/@direction	paired
All		All		roundtrip	
Backward		Backward		roundtrip	
Forward		Forward		roundtrip	
match_case	boolean	—	Match case	FindReplaceOperation/@MatchCase	paired
match_whole_words	boolean	—	Match whole words only	FindReplaceOperation/@MatchWholeWords	paired
search_across	enum Values (2)	—	Search across	FindReplaceOperation/@AcrossOptions	paired
All		All fields		roundtrip	
Current		Current field		roundtrip	
search_within	enum Values (2)	—	Search within	FindReplaceOperation/@WithinOptions	paired
All		All records/requests		roundtrip	
Current		Current records/requests		roundtrip	

evidence from real samples in v22+v26

DSL Foundation



Core Design Principles



Structure is knowledge



**Every interface element
is an interaction layer**



An aerial night view of a city, likely Stockholm, featuring a river, historic buildings, and modern skyscrapers. The image is overlaid with a dark blue gradient.

Tools

an extensible framework

Tools

- Search + Explore
- Static Code Analysis
- Dashboards + Tests
- Graph cluster algorithms
- Graph traversal strategies
- Validation gates
- Skills
- Specs + Docs



humans



agents



- Search + Explore
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- Dashboards + Tests
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- Validation gates
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SKANDIX / Search

English

← Back

Search by name: File: Object type: Options...

318 Objekte gefunden (100 geladen)

#Convert Image to JSON Matrix v2.0 -> Matrix erzeugen statt Grid Lager > ### VERSION HISTORY ### > Step 276	Script Step
#neues JS Template v1.12 -> Image Parser entfernt, Eingabe-Parameter um Matrix ergä... Lager > ### VERSION HISTORY ### > Step 279	Script Step
#Routen update alle aufgerufenen Datensätze -> Grid übergeben an JavaScript (statt ... Lager > ### VERSION HISTORY ### > Step 285	Script Step
#Grid Erzeugung per MBS: Convert Image to JSON Lager > ### VERSION HISTORY ### > Step 296	Script Step
\$\$HTML_ImageZoom Lager	Variable
\$\$ImageHeight Bilder Schnittstelle	Variable
\$\$ImageWidth Bilder Schnittstelle	Variable
\$Image PIM Einbaubilder	Variable
\$Image Lager	Variable



- Search + Explore
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SKANDIX / Search / Field / Artikel::Artikel Nr / References

English

← Back

Artikel

Source: FieldsForTables

Artikel::Artikel Nr Field EB13D47B-440D-4458-B430-0C0C662B4541

Details References Graph Tests Versions Notes

Open in FileMaker

Search references...

LayoutObject (1530) Layout (427) Script (308) Relationship (113) Field (26) BaseTable (1)

displays_field (945) reads_field · CF (851) reads_field (256) left_field (70) reads_field · Tooltip (53) right_field (41) exports_from_field (37)

sorts_by_field (35) reads_field · Hide (34) reads_field · Portal (33) sets_field (22) reads_field · Action (7) reads_field · WebViewer (7)

reads_field · Popover (4) lookup_source (3) sort_field (2) finds_in_field (1) imports_to_field (1) parent_table (1) reads_field · Auto-Enter (1)

summarizes_field (1)

Sortieren nach: Herkunft ▲ Name Link Rolle

Direction: ← 2404 → 1 ↔ 2405

Used by (2404)

Field	Artikel Attribute::Artikel Nr	lookup_source
Field	Artikel Verweise::Artikel Nr Bezug	reads_field · Auto-Enter
Field	Artikel::Anzahl Verweise ist Alternative	reads_field
Field	Artikel::Anzahl Verweise ist Zubehör	reads_field
Field	Artikel::Artikel Nr Abgleich	reads_field
Field	Artikel::Artikel Nr Code39	reads_field
Field	Artikel::Artikel Nr Filter	reads_field
Field	Artikel::Artikel Nr ist Original	reads_field
Field	Artikel::Artikel Nr kurz	reads_field
Field	Artikel::Artikel Sprache Schlüssel	reads_field
Field	Artikel::Artikel Sprache Schlüssel DE	reads_field
Field	Artikel::Artikel Sprache Schlüssel EN	reads_field
Field	Artikel::Auswertung Bestellübersicht Artikel Anzahl	summarizes_field · Count
Field	Artikel::Bildansicht	reads_field



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SKANDIX / Search

English

← Back

Search by name: e.g. Import, Email (empty = all objects) File: All files Object type: Functions Options...

Search: Filter token name... 15 / 15 Sort: ↓ Frequency

Category:

Text Functions (36) Logical Functions (15) Get Functions (71) Aggregate Functions (6) Number Functions (10) Date Functions (9)

JSON Functions (7) Design Functions (7) Details ▾ (8) Clear filters

IsValid	Logical Functions	2494	Functions
Case	Logical Functions	2486	Functions
Self	Logical Functions	2145	Functions
If	Logical Functions	1774	Functions
Let	Logical Functions	737	Functions
IsEmpty	Logical Functions	616	Functions
ExecuteSQL	Logical Functions	212	Functions
Choose	Logical Functions	37	Functions
GetNthRecord	Logical Functions	31	Functions
Evaluate	Logical Functions	25	Functions
GetAsBoolean	Logical Functions	18	Functions
GetSummary	Logical Functions	14	Functions
While	Logical Functions	7	Functions
GetField	Logical Functions	6	Functions
IsValidExpression	Logical Functions	2	Functions



- Search + Explore
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SKANDIX / Search / Script / XML Import MBS [URL] English

← Back

Wechselkurse Source: ScriptCatalog 7183A89E-04E4-4A8A-B088-21B9D98109B2

XML Import MBS [URL] Script

Details References Graph Tests Versions Notes

Script text (28 steps) View: Normal Dim Hide Expand all Collapse all Collapse multi-line calculations

Search references... 28 / 28

Variable (28) Function (5) Plugin function (3) Custom Function (1) Field (1) Layout (1) Comment (5) Clear filters

```
1 Set Variable [ $URL; Value:_ScriptParameter ( 1 ) ]
2 ▾ If [ $URL = "" ]
3   Set Variable [ $URL; Value:"https://www.ecb.europa.eu/stats/eurofxref/eurofxref-daily.xml" ]
4 End If
5 Set Variable [ $Fehler; Value:0 ]
6
7 # XML Importieren
8 Insert from URL [ $XML; $URL ] [ Select; No dialog ]
9 Set Variable [ $n; Value:PatternCount ( $XML ; "currency" ) ]
10
11 ▾ If [ $n > 0 ]
12   Go to Layout [ "XML Importieren" ]
13   Set Variable [ $Prefix; Value:"" ]
14
15   # neuen Datensatz anlegen
16   New Record/Request
17
18   # Datum auslesen
19   Set Variable [ $Date; Value:MBS( "XML.GetPathValue"; $XML; "Envelope.Cube.Cube#time"; 1 ) ]
20   Set Field [ XML Import::Date; $Date ]
21
22   Set Variable [ $i; Value:0 ]
23   ▾ Loop [ Flush: Always ]
24
25     # Währungskürzel und Wechselkurs auslesen
26     Set Variable [ $Currency; Value:MBS( "XML.GetPathValue"; $XML; "Envelope.Cube.Cube.Cube[" & $i & "]"#currency"; 1 ) ]
27     Set Variable [ $Rate; Value:MBS( "XML.GetPathValue"; $XML; "Envelope.Cube.Cube.Cube[" & $i & "]"#rate"; 1 ) ]
28
29     Set Error Capture [ On ]
30     # Wechselkurs in zugehöriges Feld schreiben
31     Set Field By Name [ $Prefix & $Currency; GetAsNumber ( Substitute ( $Rate ; "." ; "," ) ) ]
32
```

PatternCount → number
PatternCount (text ; searchString)
Returns the number of occurrences of searchString in text.
[Open local help](#)



- Search + Explore
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SKANDIX / Search / Layout / Generischer Artikel English

[← Back](#)

PIM Generische Artikel Source: Layouts
Generischer Artikel [Layout](#) 55CDE9F0-D8BF-4F08-B8B3-407E0FC25895

[Details](#) [References](#) [Graph](#) [Tests](#) [Versions](#) [Notes](#)

► Properties Fullscreen

Search layout object... [Name](#) [Type](#) [Fit](#) [100%](#) 248 objects - Zoom 80%

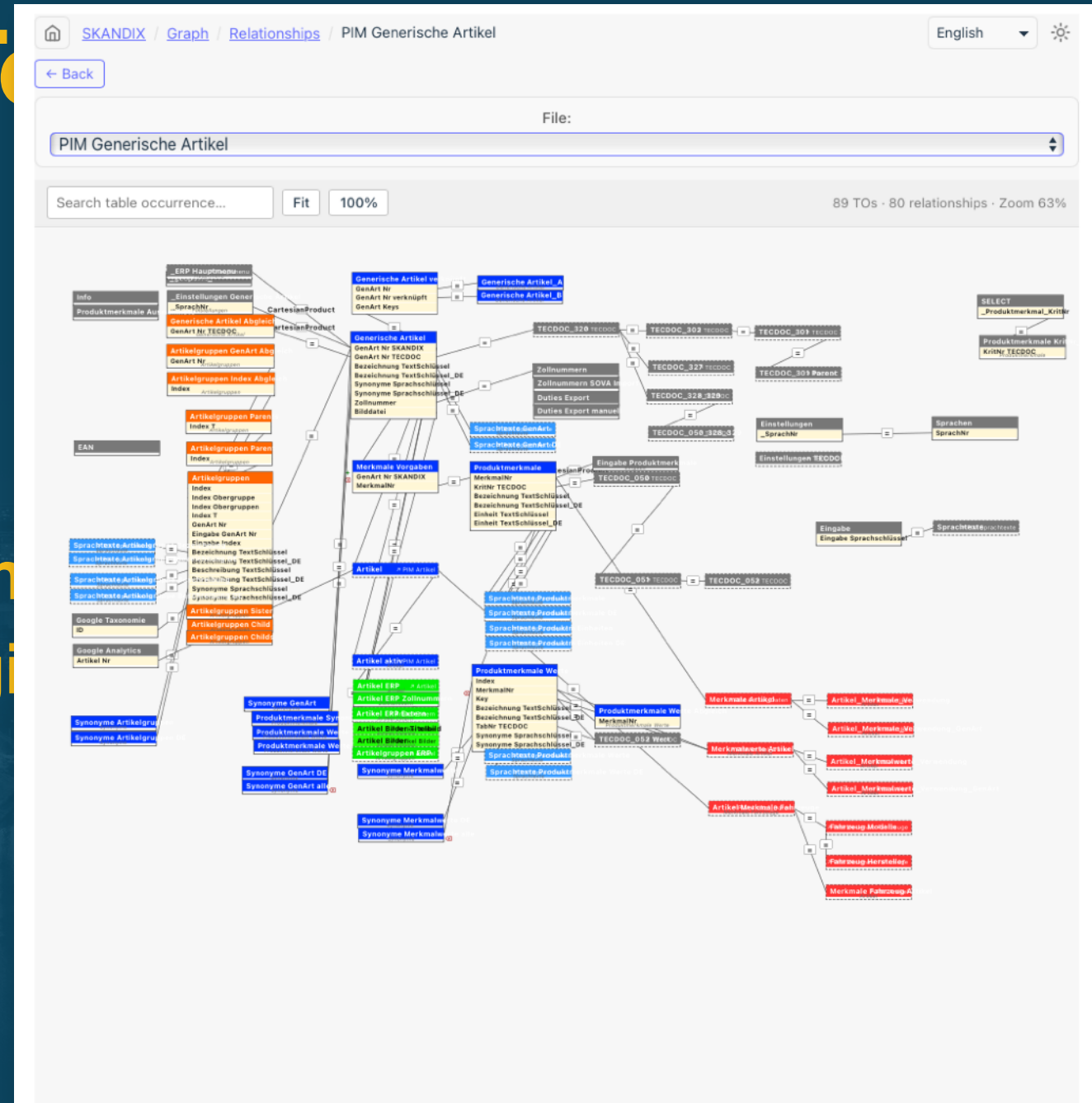
[Input \(85\)](#) [Display \(62\)](#) [Viewer \(2\)](#) [Action \(70\)](#) [Controls \(20\)](#) [Groups \(1\)](#) [Graphic \(8\)](#)

[CALCULATIONS](#) [Conditional Formatting \(12\)](#) [Hide Condition \(8\)](#) [Triggers \(2\)](#) [Tooltip \(9\)](#) [Details](#)



T

- Search + Explore
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- **Search + Explore**
- **Static Code Analysis**
- **Dashboards + Tests**
- **Graph cluster algorithm**
- **Graph traversal strategies**
- **Validation gates**
- **Skills**
- **Specs + Docs**

SKANDIX / Dashboards / Static Code Analysis / Performance

English

← Back

Dashboards

Overview of every available dashboard.

20 entries

Search...

Error Warning OK Neutral Pending Failed Standard Run all (20)

Auto-enter calculation crossing relationships 58 findings	Commit Records inside Loop 171 findings	Deeply nested Loop 11 findings
Enter Find Mode after Go to Layout 538 findings	ExecuteSQL range without BETWEEN 8 findings	Export Records inside Loop 2 findings
Freeze Window ended by Pause 5 findings	Go to Layout inside Loop 82 findings	Go to Related Record inside Loop 14 findings
Insert from URL inside Loop 24 findings	Layouts with unstored calculations 2063 findings	Minimal index with automatic indexing on 520 findings
Navigation script without Freeze Window 413 findings	OnRecordLoad trigger 140 findings	Open URL inside Loop 14 findings
Perform Find inside Loop 18 findings	Refresh Window flushing cached joins 88 findings	Sort Records inside Loop 2 findings
Unstored calculation field 2147 findings	Unstored calculation with host round trip	



- Search + Explore
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SKANDIX / Tests / Solution Tests / Calculation and Variable Hygiene

English

← Back

Calculation and Variable Hygiene

Checks on the calculation and variable layer: formulas that consist entirely of a comment and therefore never evaluate, comment markers that cannot nest, variables written but never read, variables read but never written, and variable names containing spaces. Covers field calculations, auto-enter and validation formulas, custom functions and script-step calculations.

Metadata

MEMBERS	PROFILES	TEST TYPE	TIER	VERSION	VALIDATION	UNRESOLVED
5	2	error-check	System	1.1.0	OK	0

Section	Solution Tests
Object types	Script, CustomFunction, Field
Scopes	solution · file · object · object-list · cluster
Outputs	count · findings-table
Keywords	calculations, variables, hygiene, fmcheckmate
Test ID	calc-variable-hygiene
Skill call	/fm-test calc-variable-hygiene

Profiles

2 entries

Search...

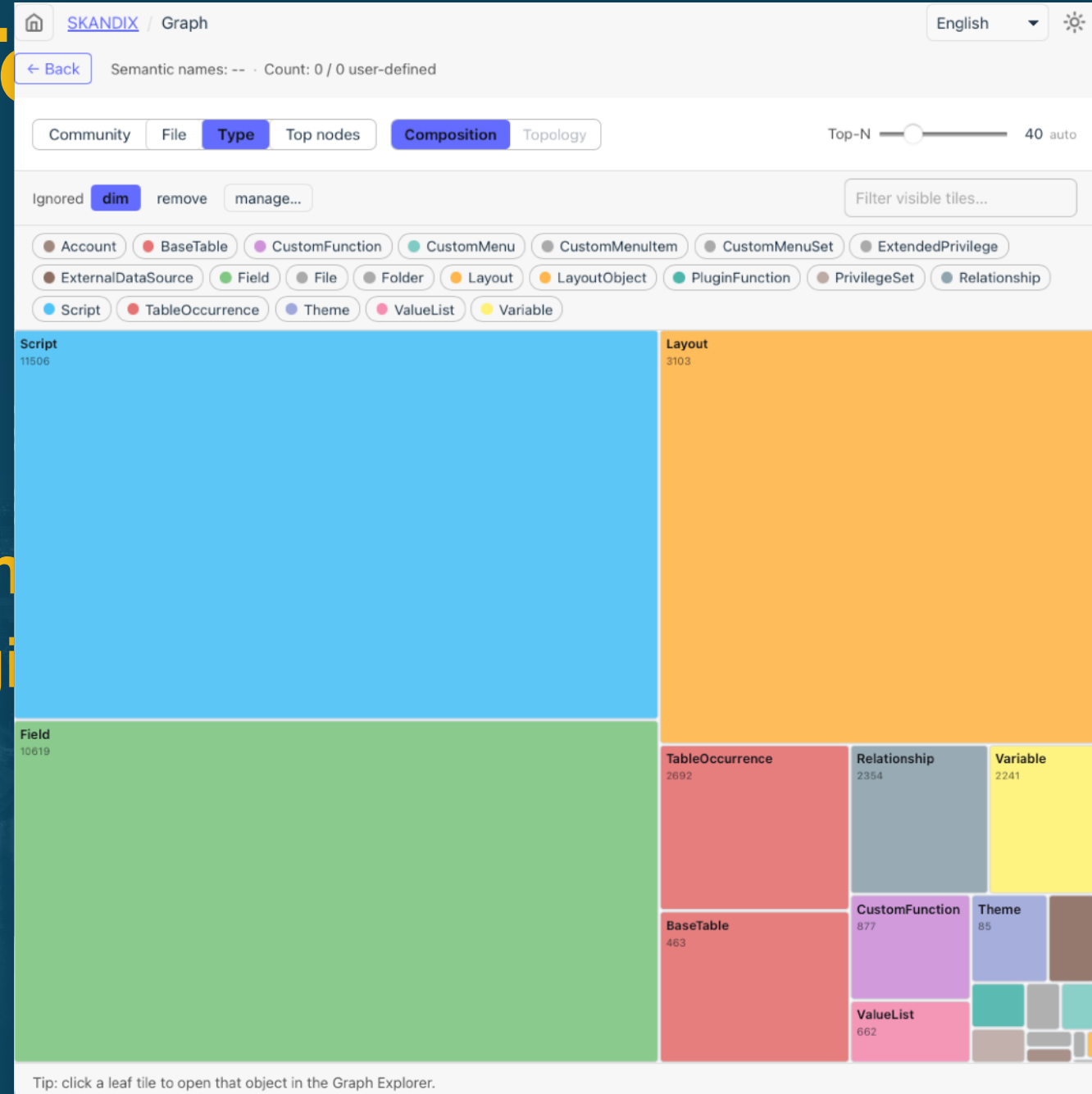
PROFILE	SCOPE	DESCRIPTION	ID
Quick Check	2/5	The two checks that point at real defects — a formula switched off by a comment and a variable name that changes how it has to be read.	
Full Check	5/5	—	

Click a profile to highlight its members in the list below — click it again to clear.



- Search + Explore
- Static Code Analysis
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T





- Search + Explore
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- Skills
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SKANDIX / Search / Script / Datei per eMail [Sortierung, Belegtyp] / Graph

English

← Back

Belege

Datei per eMail [Sortierung, Belegtyp] Script

Source: ScriptCatalog

3130B11D-2D42-4B61-AD3B-F45749853D9D

Details References Graph Tests Versions Notes

Fit Re-layout Fullscreen Trace

1000 nodes · 11747 edges

FOCUS OBJECT

Datei per eMail [Sortierung, ...] Details

FILTER VIEW

Filter nodes by name...

FILE

group

All files

DEPTH: 2 (OF 11)

deeper 1146 reachable, load capped at 1000

1000 loaded · 1000 connected

DIRECTION

Uses Used by Both

NODE TYPES

All types Selected only

Script 427 Field 347

Layout 158 Variable 38

TableOccurrence 11

CustomFunction 9 ValueList 5

BaseTable 4 Theme 1

Loaded 1000 of 1146 reachable nodes — lower the depth or narrow the type filter to load them all.



- SKANDIX / Graph

English

← Back Semantic names: -- · Count: 0 / 0 user-defined

Community File Type Top nodes Composition Topology

Top-N 60 auto

Ignored dim remove manage...

Filter visible tiles...

Account BaseTable CustomFunction CustomMenu CustomMenuItem CustomMenuSet ExtendedPrivilege ExternalDataSource Field File Folder Layout LayoutObject PluginFunction PrivilegeSet Relationship Script TableOccurrence Theme ValueList Variable

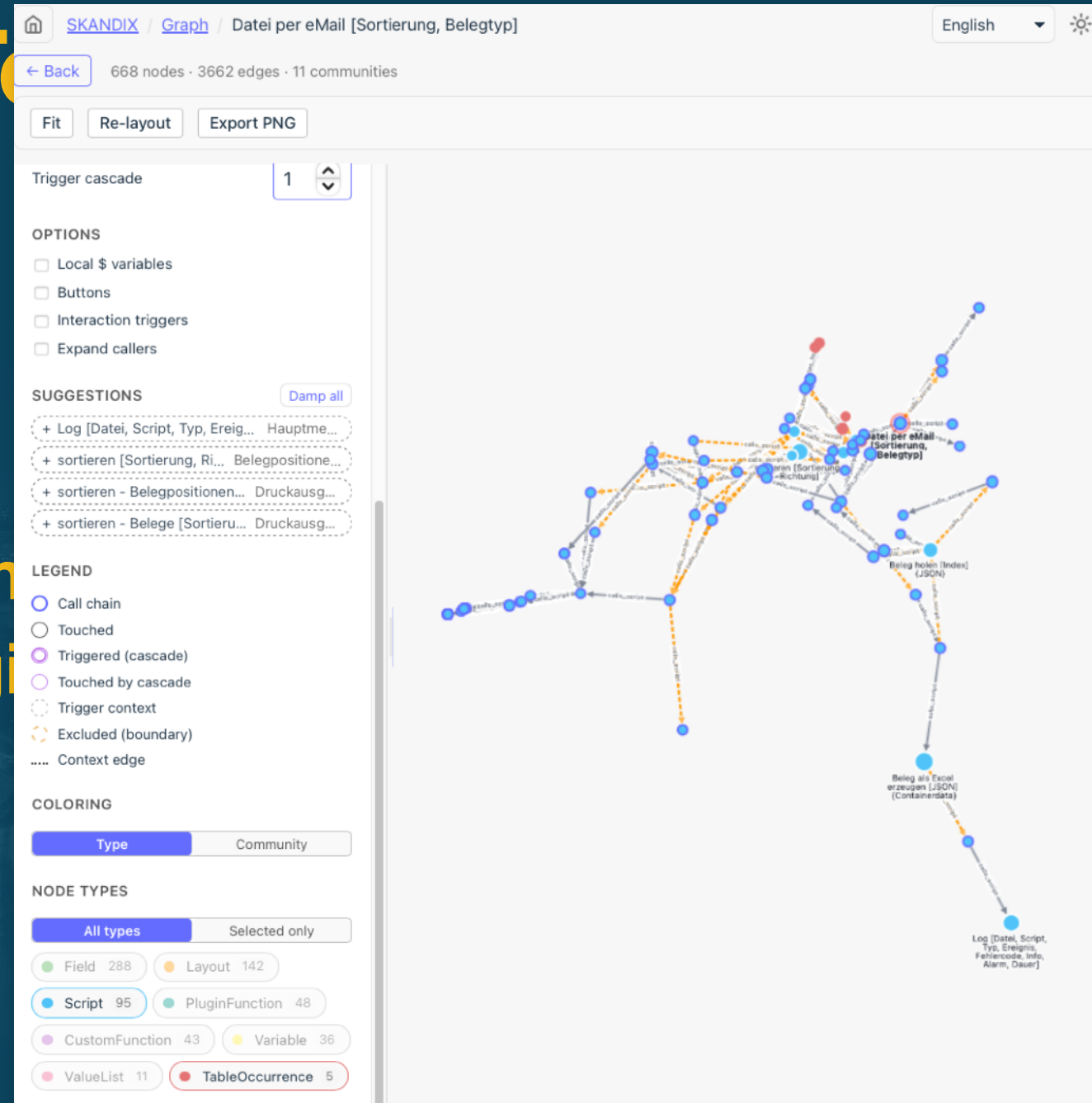
Shopschnittstelle
Shopschnittstelle_Logs
PIM Einbaubilder_Daten
PIM Einbaubilder
PIM Sprachtexte
PIM Einstellungen
PIM Merkmale
Bilder Schnittstelle
PIM Generische Artikel
PIM DMS
PIM Artikel
Log
PIM Artikel_Daten
Artikel Bilder
Wechselkurse
Druckausgabe Etiketten
API
Auswertungen
Aufträge Verkauf
Aufträge Import
Workflow
Exportkalkulator
Benutzer
Druckausgabe
Historie
PIM USA
Abrechnungsliste
Auswertungen
Ergebnisse
Gruppen
Zahlungsverkehrskonten
Buchhaltung
Aufträge Einkauf
Bestände
Versandlisten
Versandschnittstelle
Amazon Abrechnungsliste
Kunden
Belege
Adressen
Belegpositionen Einkauf
CallerAPI
Artikel Ein
Lager
Artikel Liste
Artikel Import
Lager Routen

Tip: click a super-node to open its heaviest member in the Graph Explorer.



- Search + Explore
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- Validation gates
- Skills
- Specs + Docs

T





- Search + Explore
- Static Code Analysis
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T

SKANDIX / fm-spec

English

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fm-spec

Schema viewer for the generative reference

SCHEMA	FM VERSION (SHAPES)	FM VERSION (DOCS)	BUILT AT	SCRIPTSTEPS	FUNCTIONS	LOCALES
2.9.0	22 · 26	26	9/16/2026	216	375	11 / 11
GRAMMAR COVERAGE	TRIGGERS	ERROR CODES				
232/216 steps	26	294				

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ScriptSteps

Functions

Triggers

Error Codes

Locales

12 / 216

All platforms

perform

STEP ID	NAME (EN)	CATEGORY ID	CATEGORY	ORIGIN VERSION	GRAMMAR
1	Perform Script	1	Control script steps	6.0 or earlier	YES
28	Perform Find	6	Found Sets script steps	6.0 or earlier	YES
67	Perform AppleScript (macOS)	13	Miscellaneous script steps	6.0 or earlier	YES
128	Perform Find/Replace	3	Editing script steps	6.0 or earlier	YES
150	Perform Quick Find	6	Found Sets script steps	11.0	YES
164	Perform Script On Server	1	Control script steps	13.0	YES
175	Perform JavaScript in Web Viewer	13	Miscellaneous script steps	19.0	YES
210	Perform Script On Server with Callback	1	Control script steps	20.1	YES
214	Perform SQL Query by Natural Language	10	Artificial intelligence script steps	22.0	YES
218	Perform Semantic Find	10	Artificial intelligence script steps	21.0	YES
219	Perform RAG Action	10	Artificial intelligence script steps	22.0	YES
221	Perform Find by Natural Language	10	Artificial intelligence script steps	22.0	YES



Too

- Search + Explore
- Static Code Analysis
- Dashboards + Tests
- Graph cluster algorithms
- Graph traversal strategies
- Validation gates
- Skills
- Specs + Docs

```
docs > agents > query-cookbook.md > # Query Cookbook — SQL Patterns & DuckDB Idioms Text-Editor
1  # Query Cookbook — SQL Patterns & DuckDB Idioms You, vor 2 Monaten • C
18
19  ## DuckDB idioms worth using
20
21  When building complex SQL, research syntax with the
22  `duckdb-skills:duckdb-docs` skill.
23  Particularly useful here:
24
25  - **DuckDB-specific syntax:** `GROUP BY ALL`, `ORDER BY ALL`, `SELECT *
  EXCLUDE(...)` , `SELECT * REPLACE(...)` , the `COLUMNS()` expression
26
27  - **Efficient aggregation:** `arg_max()` / `arg_min()` instead of complex
  window functions, `QUALIFY` instead of subqueries
28
29  - **String/list functions:** function chaining (`'text'.upper().replace
  (...)`) , list comprehensions, slicing
30
31  - **Query structure:** `FROM`-first queries, `UNION BY NAME`, CTEs
  instead of repeated subqueries
32
33  - **XML access:** `xml_extract_text(Object_XML, '/xpath')[1]` for
  polymorphic attributes in LayoutObjects (requires `LOAD webbed;`)
34
35  ## Basic object queries
36
37  **List all scripts (excluding folders/separators):**
38  ```sql
39  SELECT Script_ID, Script_Name
40  FROM ScriptCatalog
41  WHERE (Folder_Type IS NULL OR Folder_Type = 'False')
42  | AND NOT Is_Separator
43  ORDER BY Script_Name;
44  ```
45
46  **Fields of a table:**
47  ```sql
48  SELECT Field_Name, Field_Type, Data_Type
49  FROM FieldsForTables
50  WHERE Table_Name = 'YourTableName'
51  ORDER BY Field_ID;
52  ```
53
54  **Check object existence (across all object types):**
55  ```sql
56  SELECT Object_Type, Object_Name, File_Name
```




Too

- Search + Explore
- Static Code Analysis
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call-chain-resolution

Question forms: "who calls X / what does X call?", "where does this chain start?", "escalating calls", "does this recurse?", symptom entries like "hangs" or "runs twice".

Object types: Script, Layout, LayoutObject.

Procedure:

1. **Entry points are three roles, not one.** Collect callers via `ObjectLinks.Link_Role IN ('calls_script', 'trigger_script', 'triggers_script')` — script→script calls, scripttrigger sources, and layout-object trigger sources. Who only follows `calls_script` misses layout and object triggers. (Structural containment `parent_script` is hierarchy, not a call.)
2. **Walk the chain** with a recursive CTE carrying a path array for cycle detection (no extension, no `CYCLE` clause needed).
3. **The edge is context-free.** `ObjectLinks` has no `step_anchor` and `Link_Subrole` is NULL for all three roles — the edge cannot tell you which step calls, whether it is `Perform Script` (Step_ID 1), `Perform Script on Server` (164) or PSoS-with-callback (210), nor whether the call sits inside a loop or under a condition. For execution context use the **step-based second path:** `v_script_block_tree WHERE Step_ID IN (1, 164, 210)` (loop/If depth per call site), callee resolved separately.
4. Step 164/210 marks a **server boundary** — the callee subtree runs server-side (relevant for the `platform-context` pattern).

SQL building blocks:

```
-- Callers across all three entry roles
SELECT src.Object_Type, src.Object_Name, src.File_Name,
       ol.Link_Role
FROM   ObjectCatalog tgt
JOIN   ObjectLinks ol  ON tgt.Object_UUID = ol.Target_UUID
JOIN   ObjectCatalog src ON ol.Source_UUID = src.Object_UUID
WHERE  tgt.Object_Type = 'Script' AND tgt.Object_Name = '<script>'
       AND ol.Link_Role IN ('calls_script', 'trigger_script',
                           'triggers_script');

-- Downward chain with cycle guard (path array)
WITH RECURSIVE chain AS (
  SELECT ol.Source_UUID, ol.Target_UUID, 1 AS depth,
         [ol.Source_UUID, ol.Target_UUID] AS path
```




Too

- Search + Explore
- Static Code Analysis
- Dashboards + Tests
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5. Analytic workflows

For object analyses prefer the dedicated skills over ad-hoc SQL — they encapsulate the resolution and dependency logic:

- `fm-summarize` — technical description of a single object (structure, flow, dependencies); `--short` for 1–2 paragraphs
- `fm-analyze` — business purpose of an object from its context (call chain, triggers, naming, comments); `--short` available
- `fm-test` — run curated **Analysis Tests** (bundled SCA rules / custom queries with a result model) on a solution, file, object, object list or cluster; `--find` for discovery
- `fm-graph-cluster` — segment the object graph into modules/communities, name them semantically
- `fm-deep-research` — solution-level research report (business context, architecture, technical build, findings, recommendations, segments) rendered from a template into `output/`; checks for a usable partition first and offers `fm-graph-cluster` when it is missing
- `fm-open` — open the object under discussion directly in FileMaker (via fmIDE)
- `fm-show` — open the object in the FM-Lab web frontend (detail / references / graph)

Offer tests & patterns proactively: for object-, cluster- or solution-level analyses — and especially for **symptom descriptions** ("hangs", "slow", "wrong results", "unexpected behavior", "escalating calls") — first check whether matching Analysis Tests (`/fm-test --find, GET /api/tests`) or an analysis pattern (`docs/agents/analysis-patterns.md`: `call-chain`, `control-flow/reachability`, `window lifecycle`, `platform context`) exist, and offer them to the user as a structured complement to `fm-analyze/fm-summarize`: tests give reproducible, curated checks with findings; the skills give free interpretation. This is an offer, not a mandatory step.

Look up before you write SQL. For recurring subjects the query already exists — consult it *before* composing ad-hoc SQL and *before* writing any private helper script:

About to ...	Read first
read a script's steps	<code>query-cookbook.md</code> § Script dump
find callers / walk a call chain	<code>analysis-patterns.md</code> <code>call-chain-resolution</code>
judge branch scope, dead code, reachability	<code>analysis-patterns.md</code> <code>control-flow-reachability</code>



- Search + Explore
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- Validation gates
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To

Built-in Skills

fm-show

+ more ...

fm-open

fm-trace

fm-summarize

fm-analyze

fm-test

fm-graph-cluster

fm-deep-research

fm-generate-script

*powerful
stuff*

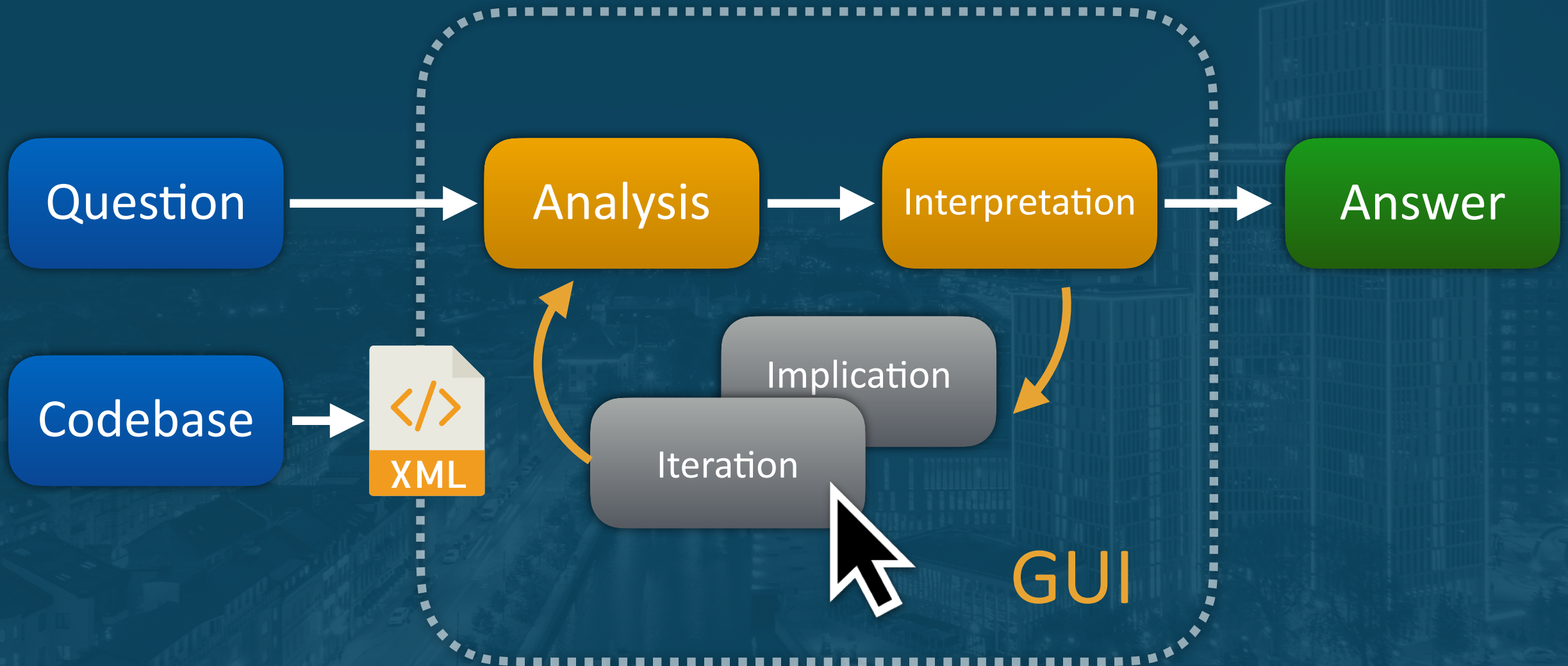


An aerial night view of a city, likely Copenhagen, featuring a river (Nørrebro) and several modern skyscrapers (the 'Copenhagen Towers') on the right. The city lights are visible in the background under a dark blue sky.

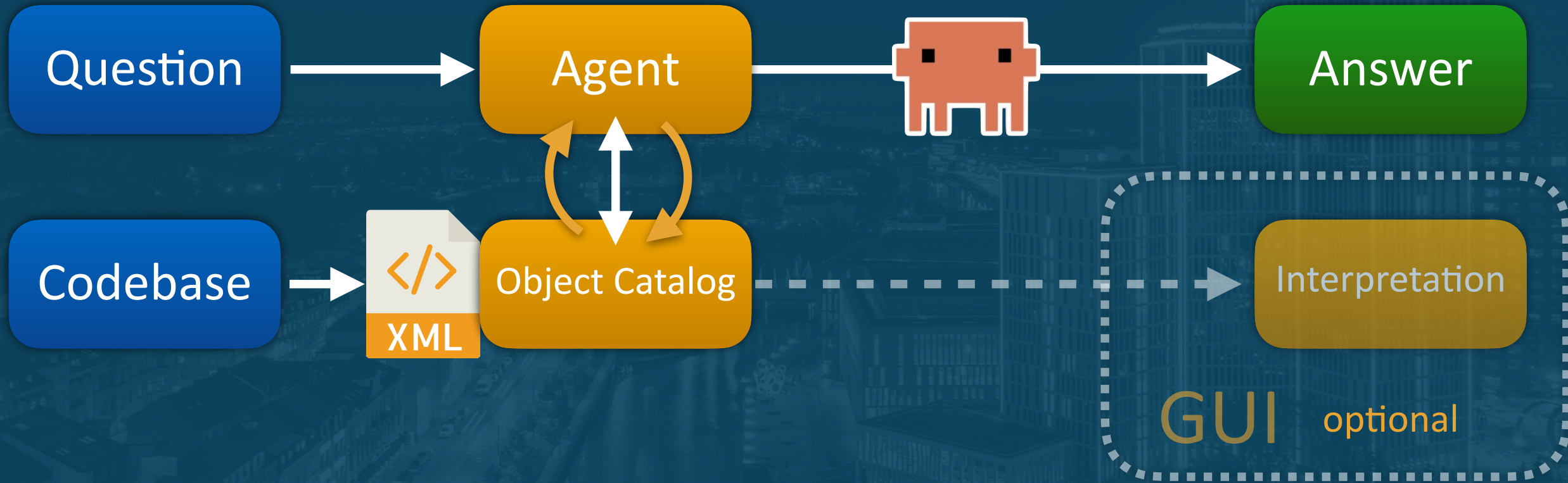
Agentic analysis

the deep research

Classic Code Analysis

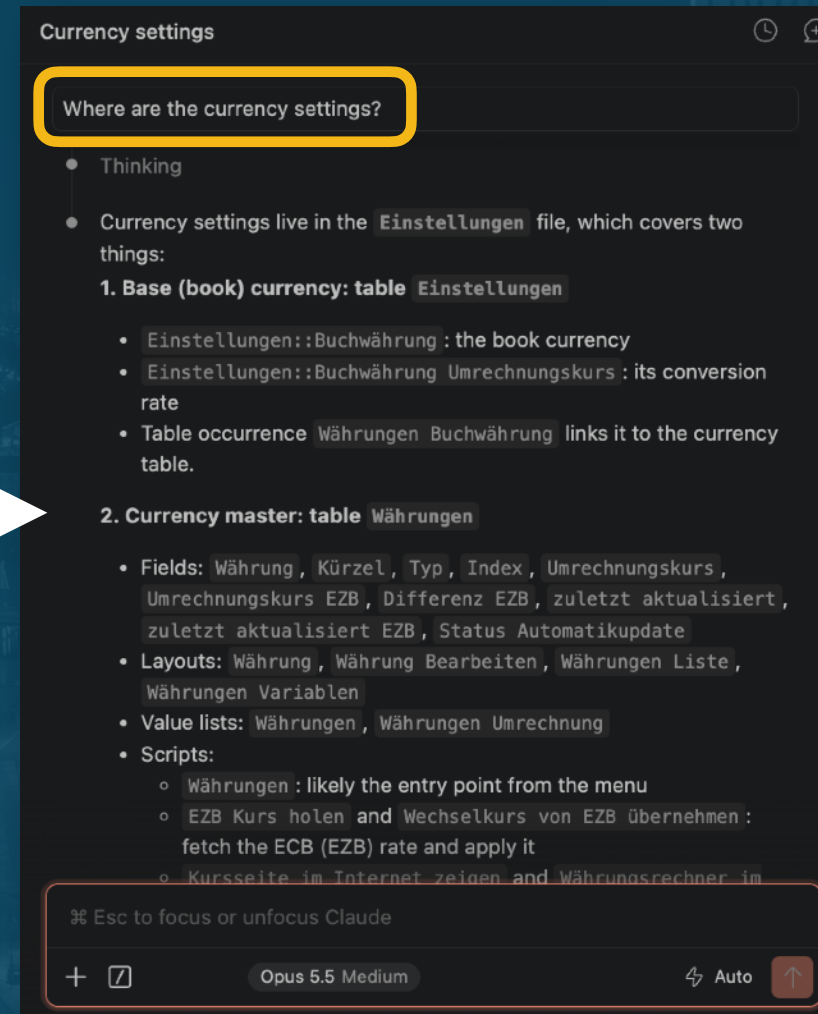
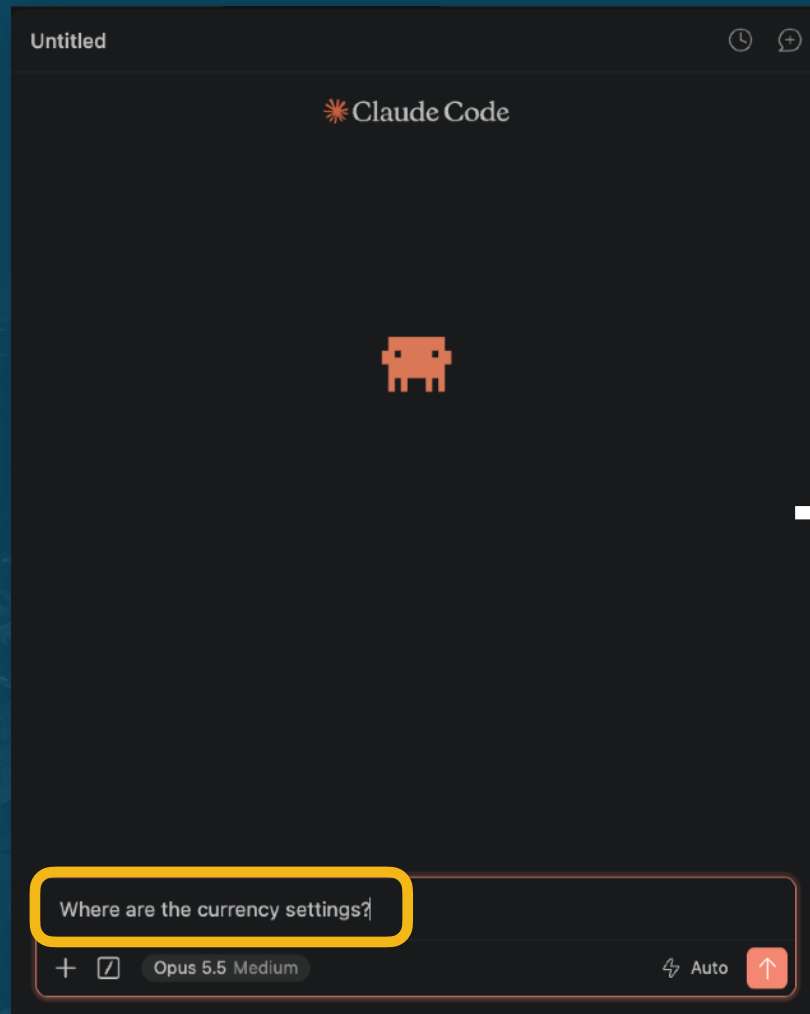


Agentic Code Analysis



Agentic Code Analysis

simply ask any question!



Agentic Code Analysis

2 Strategies

Agentic Session

System Prompt

Ad Hoc Queries

Object Catalog

Your FileMaker Solution

Agentic Session

System Prompt

Skill

Skill

Skill

References

Gateways

Patterns

Tools

Specs

Tests

Runtime Contexts

SCA

Custom
Queries

Graph Clusters

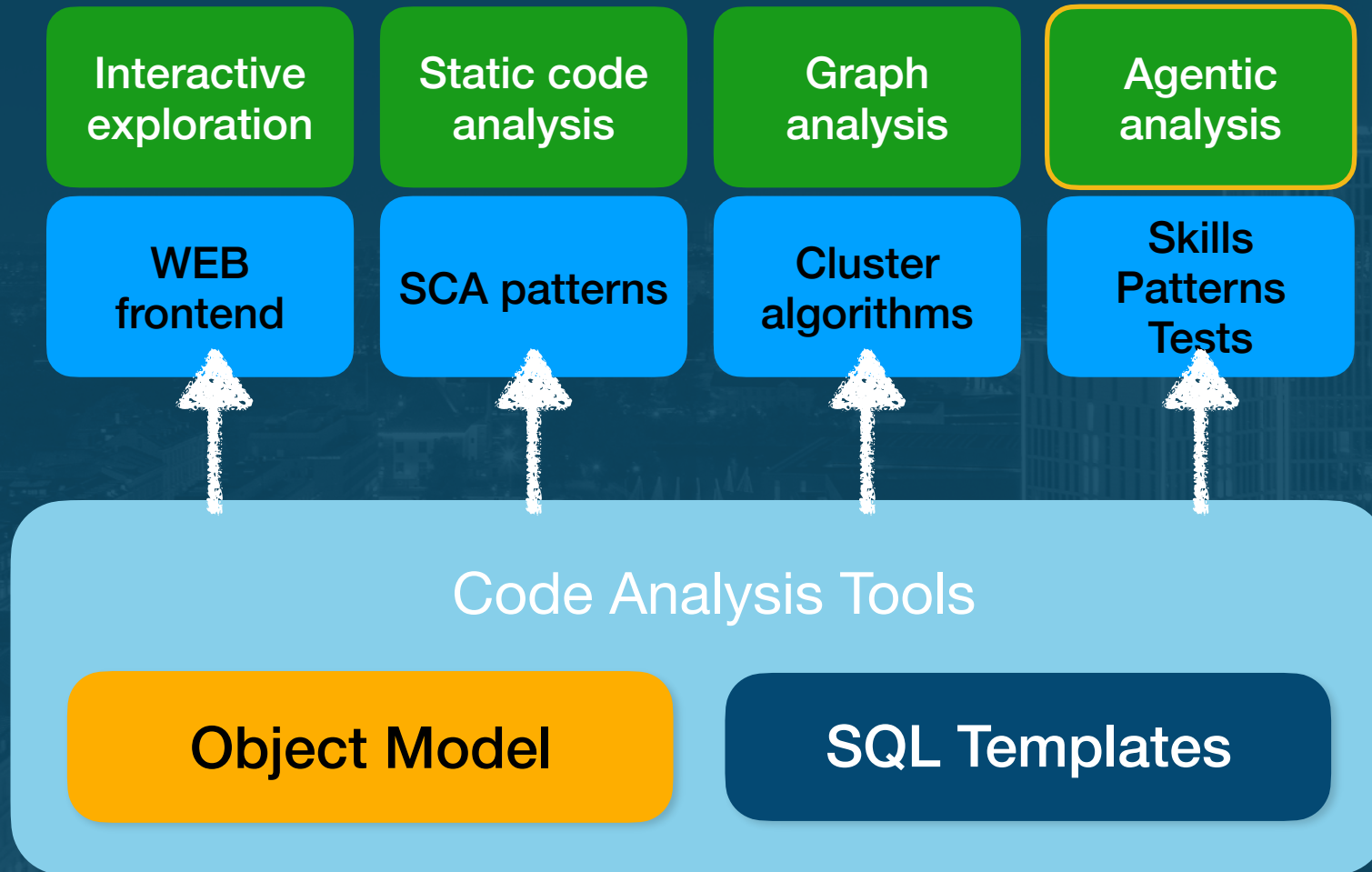
Operational Metadata

Object Catalog

Your FileMaker Solution

Code Analysis

4 Approaches



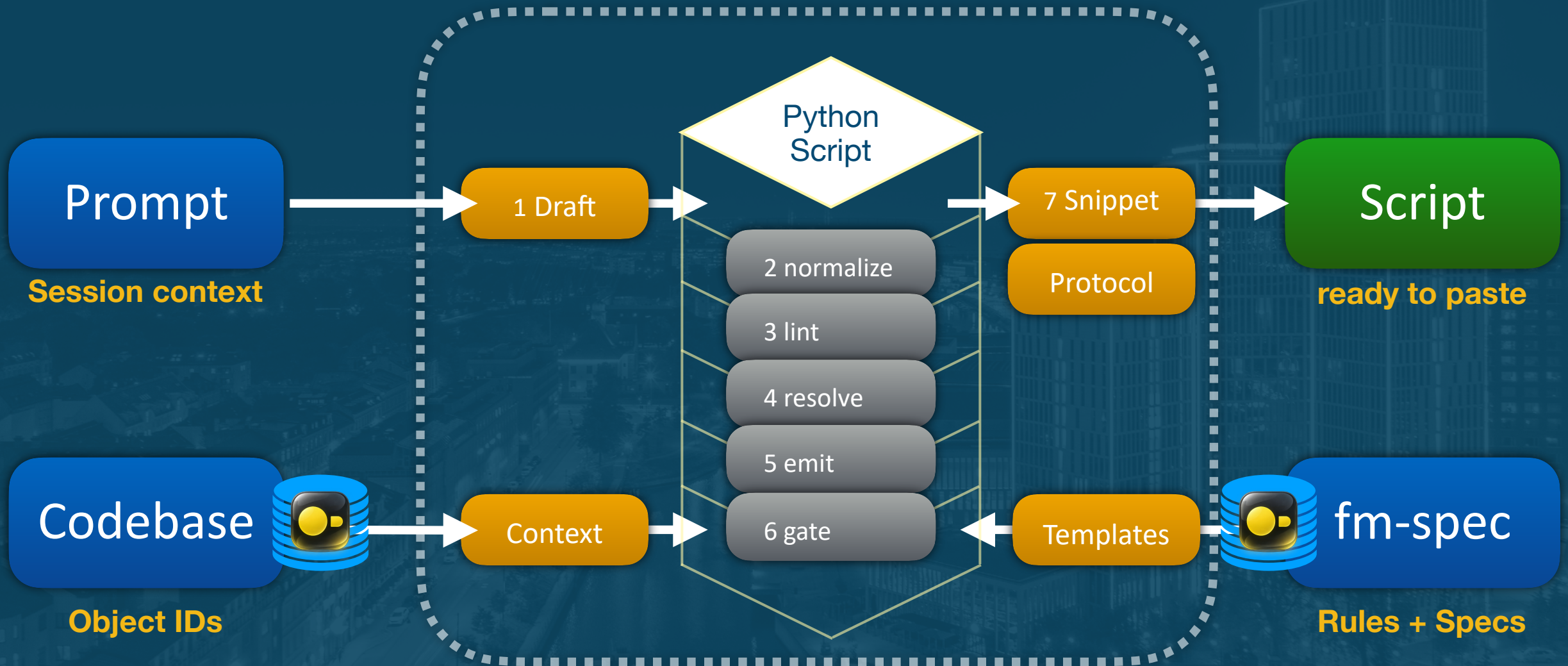


An aerial night view of a city, likely Stockholm, featuring a river, historic buildings, and modern skyscrapers. The image is overlaid with a dark blue filter. The text 'Agentic coding' is prominently displayed in yellow, and 'a reliable source' is in white below it.

Agentic coding

a reliable source

Agentic Code Generation

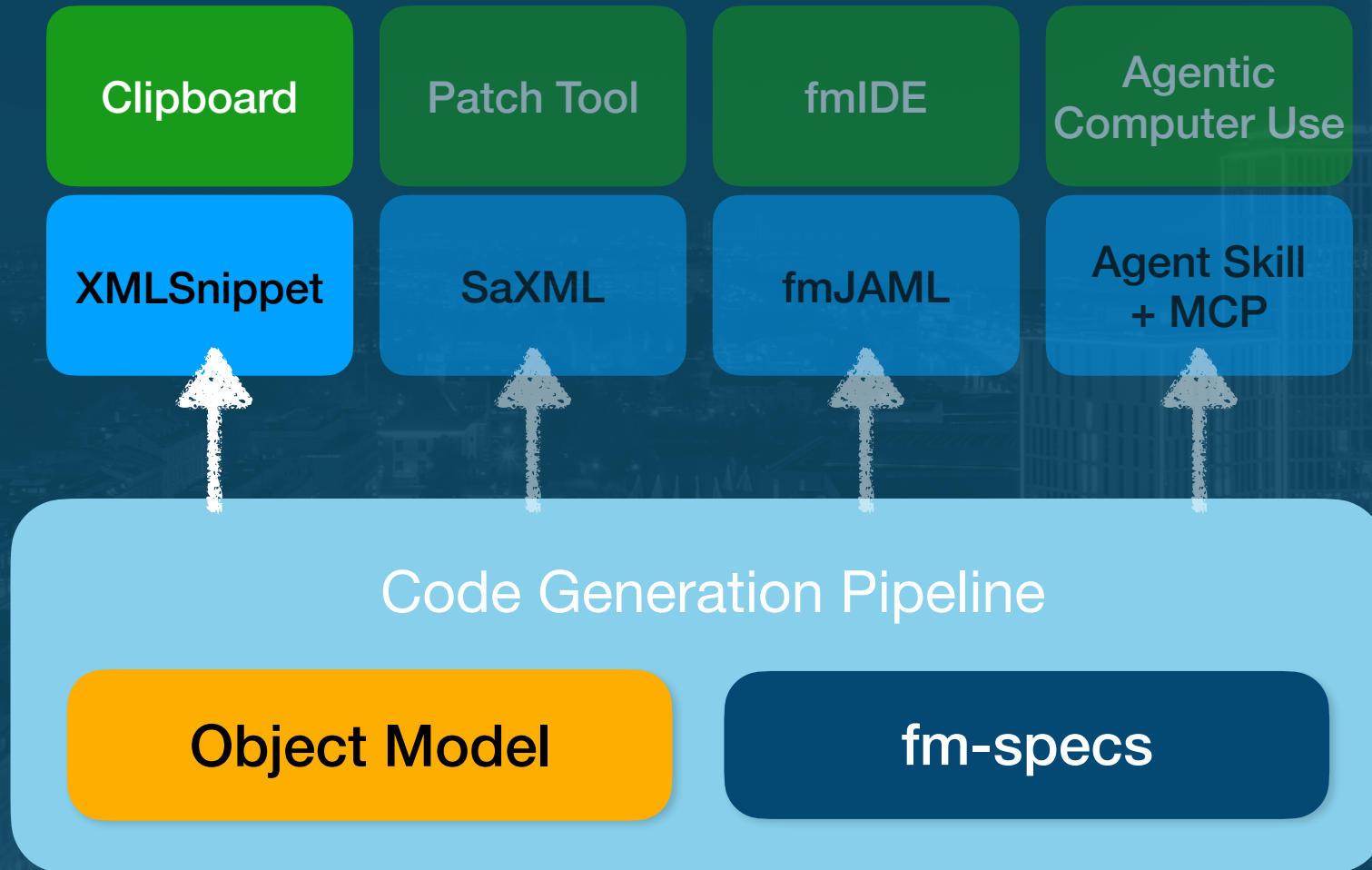


Agentic Code Generation

- **context driven**
- **grounded in your solution's thruth**
- **guided by spec rules**
- **correct syntax + grammar**
- **extensible for other output formats**

Agentic Code Generation

4 Approaches

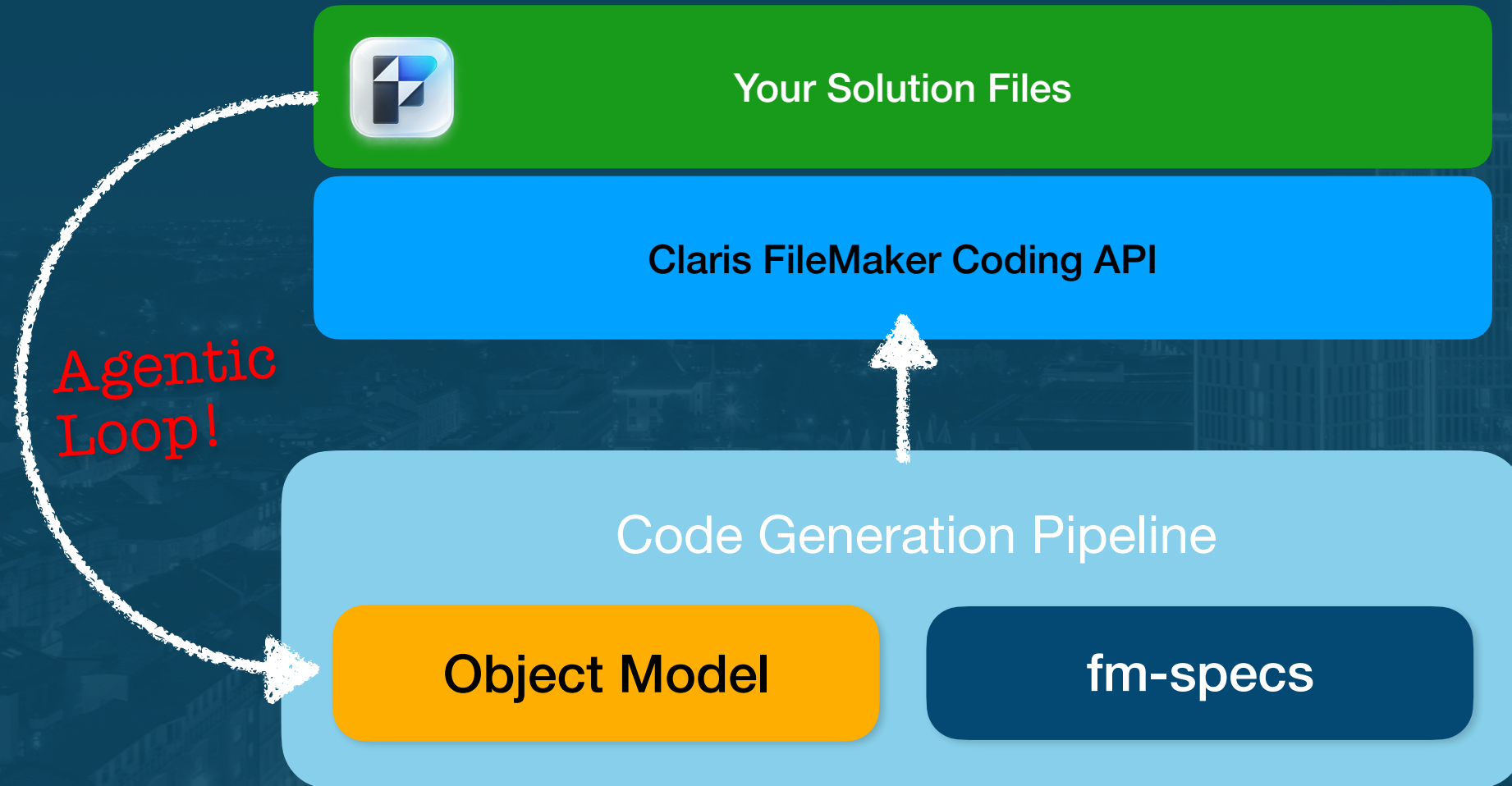


Agentic **Code** Generation

Claris ?

Agentic Code Generation

if Claris provides a clean API





An aerial night view of a city, likely Copenhagen, featuring a river (Nørrebro) and several modern skyscrapers (the 'Copenhagen Towers') on the right. The city lights are visible in the background, and the foreground shows a mix of older and newer buildings.

Relevance

bottom line for the agentic approach

Why it was built



- **A complex FileMaker solution.**
- **Developed and expanded over 30 years.**
- **At the heart of a growing company.**
- **Change is accelerating...**
- **...and so is the backlog!**
- **Many issues can no longer be resolved, because they are blocked by daily business.**

How it matters today

- **Agentic Analytics saves valuable time!**
- **Upfront time spent for investigation**
- **Dev time for integration**

before:

- 1-2 hours research
- 1-4 hours to deliver

now:

- 5 mins research
- 15-60 min to deliver



many issues + requests could be solved
ad hoc in a reasonable timeframe

How it matters today



- **A lifesaver for complex** legacy systems.
- **A speed boost for** prototypes.
- **Like a reliable teammate you can count on.**





An aerial night view of a city, likely Copenhagen, featuring a river (Nørrebro) and several modern skyscrapers (the 'Copenhagen Towers') on the right. The city lights are visible in the background, and the foreground shows a mix of older buildings and modern architecture.

Mission status

Progress so far

Mission Status



- **Base architecture ready.**
- **Modular framework in place.**
- **Battle-tested in real-world scenarios by 10 external pro devs.**

*many more things
on the roadmap...*



- **Web frontend as own app (no AI needed).**
- **Full fm-spec coverage for v22+v26.**
- **Integrations for fmIDE + MBS.**



- **Mature AI analysis workflow.**
- **First AI code generation (scripts only).**

Mission Status



- **Built for** own needs
- **8 months** of work
- **800 hours** architecture + specification
- **1,200+** hours agentic coding
- **850 commits** (dev repo)

*translates to years
of human coding*

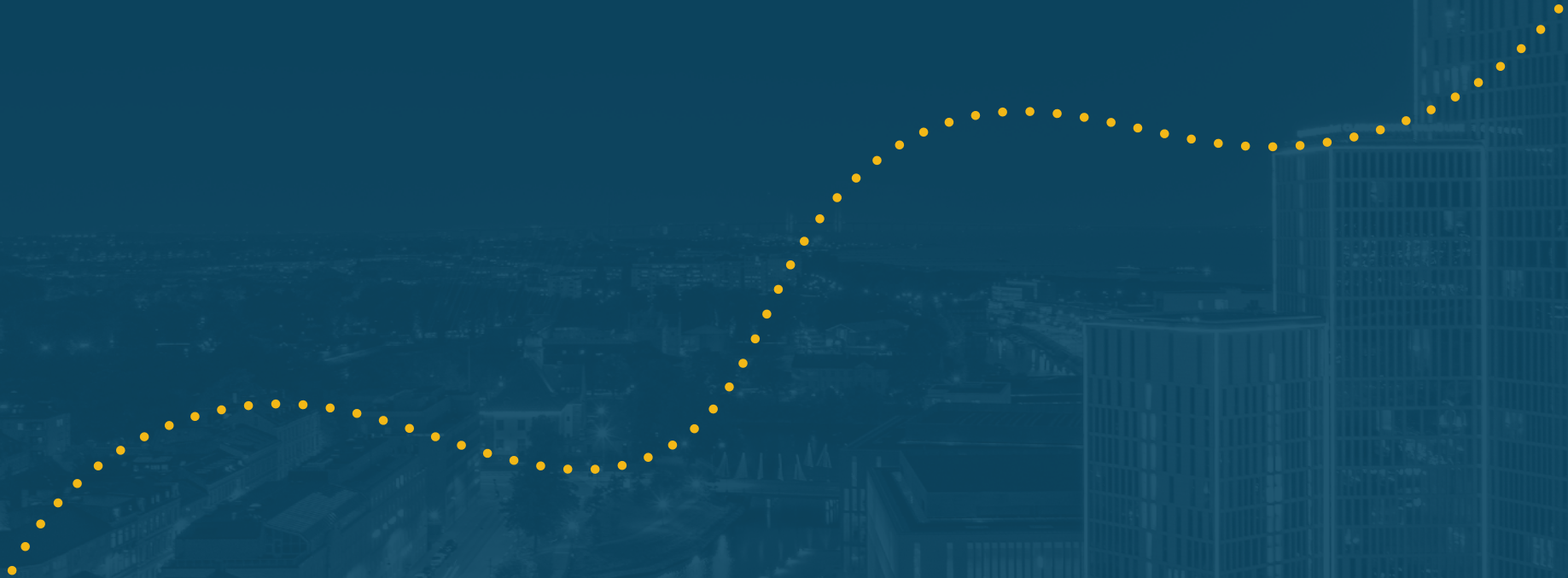


- **~160,000 lines** of specification
- **~200,000 lines** of code
- **~20 billion tokens** used
- **made with** Opus + Fable



major milestones achieved

significant efforts made





DEMANDS
DISCRETION

An aerial night view of a city, likely Copenhagen, featuring a river (Nørrebro) and several modern skyscrapers (the 'Copenhagen Towers') on the right. The image is overlaid with a dark blue tint. The text 'the next chapter' is prominently displayed in the center-left in a bold, yellow, sans-serif font. Below it, the text 'Your turn to explore the possibilities!' is written in a smaller, white, sans-serif font.

the next chapter

Your turn to explore the possibilities!

Free! & Open Source

- **Built on** Open Source.
- **MIT License.**
- **Self contained** setup.
- **Quickstart** guide.

*my contribution to
this awesome community ❤️*

Free! & Open Source

- **You can** just use it **today.**
- **You can** modify **it.**
- **Build your** own tooling **on top of it.**



Free! & Open Source

marcel-more / fm-lab

Code Issues 1 Pull requests Agents Discussions Actions Projects Security and quality More

fm-lab Public

main 1 Branch 35 Tags Go to file

About

Open Source framework for agentic FileMaker development. Turns SaXML exports into a fast DuckDB-powered digital twin for analysis, documentation, and AI-assisted coding.

developer-tools duckdb filemaker harness ide rest-api saxml xml

Readme MIT license Activity 22 stars 2 watching 8 forks

Releases

File	Version	Commit
.claude	v0.9.12	last week
.devcontainer	v0.9.9	3 weeks ago
.fmlab	v0.9.13	16 hours ago
apps/web	v0.9.13	16 hours ago
db	Initial commit	5 months ago
docs	v0.9.13	16 hours ago
ingestion	v0.9.13	16 hours ago
logs	Initial commit	5 months ago
packages/shared	v0.9.12	last week
reference	v0.9.12	last week
rest-api		
scripts		
solutions/default/xml		
tools		
.env.example		
.gitattributes	v0.8.6	3 months ago
.gitignore	v0.9.13	16 hours ago
Banner.jpg	v0.8.6	3 months ago
CHANCELOC.md	v0.9.13	16 hours ago

Languages

- TypeScript 38.7%
- JavaScript 27.9%
- Shell 16.7%
- Python 8.8%
- CSS 6.8%
- Awk 0.8%
- Other 0.3%

<https://github.com/marcel-more/fm-lab>

README MIT license

FM-Lab: AI Agent Coding Harness for FileMaker

Winner of the FileMaker Magazin Award 2026 — Best FileMaker Tool

Reliable FileMaker development starts with a shared understanding of FileMaker principles and the structure of the solution at hand — for both humans and AI agents.

FM-Lab provides that foundation by converting **FileMaker SaXML exports** into a queryable **DuckDB catalog**. It turns the XML structure of a FileMaker solution into a fast, in-memory digital twin — covering all object types and their dependencies — for deep cross-reference analysis, documentation, and AI-assisted development at scale.

fm-lab AI Agent Coding Harness for FileMaker

Collaborative Environment: Humans & Agents

SaXML: FileMaker Structure Export

DuckDB Catalog: Fast In-Memory Analytics Engine

Digital Twin: Objects, Dependencies & Context

Agentic Development: Analysis, Documentation & Assisted Development

Deep Analysis, Documentation, Refactoring, Code Generation

Searching through metadata and understands the structure of the solution in every little detail.

"DuckDB is a key enabler here. Its role in this architecture is hard to overstate. It turns code analysis from digging through static files into querying a live map of the solution in memory. This RAM-accelerated, in-process architecture removes the drag of disk-heavy workflows and makes deep catalog and graph analysis practical."

Easy setup

a) **CLI + Docker**



b) **VS Code + Dev Containers (Docker)**

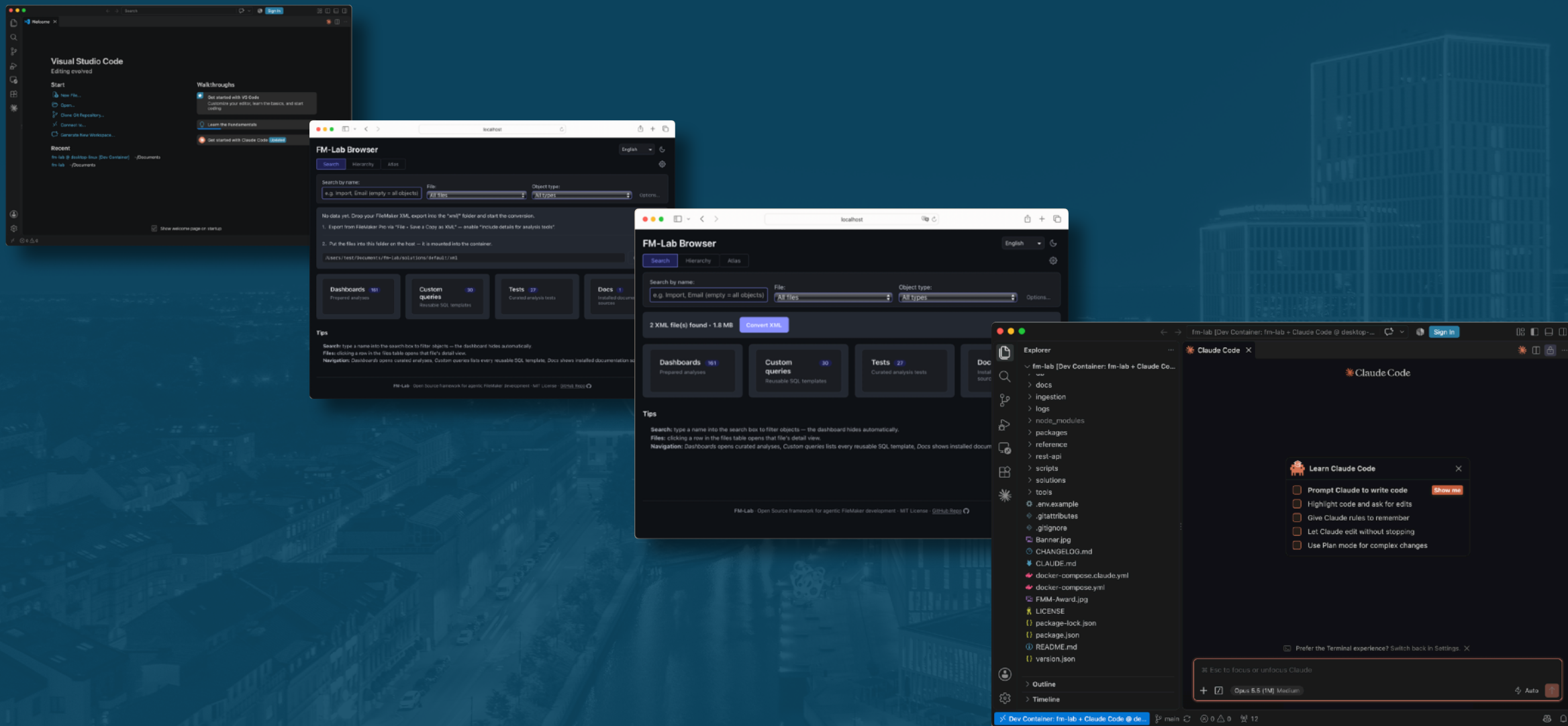
c) **CLI only** (no Sandbox)

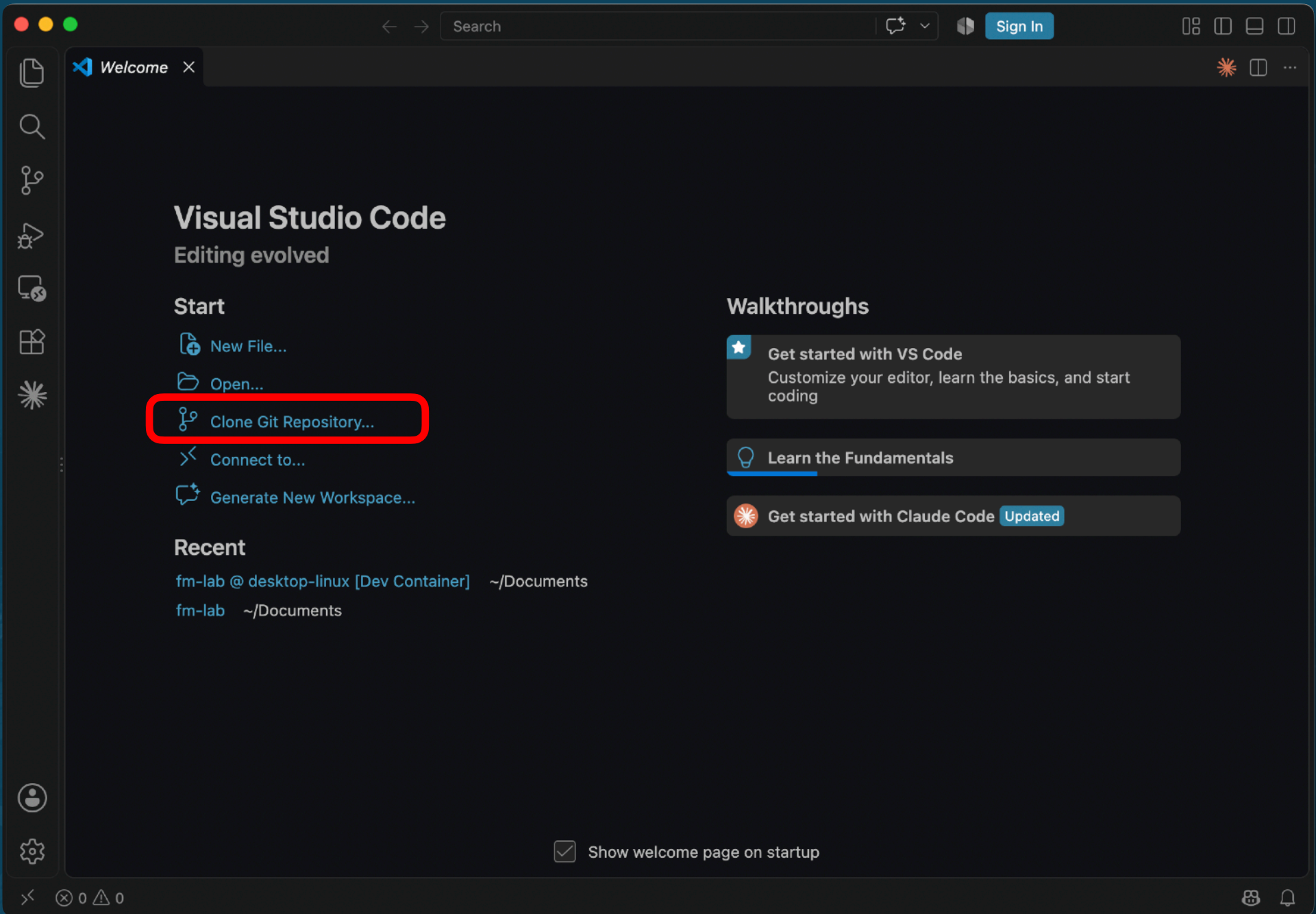
FM-Lab
Framework

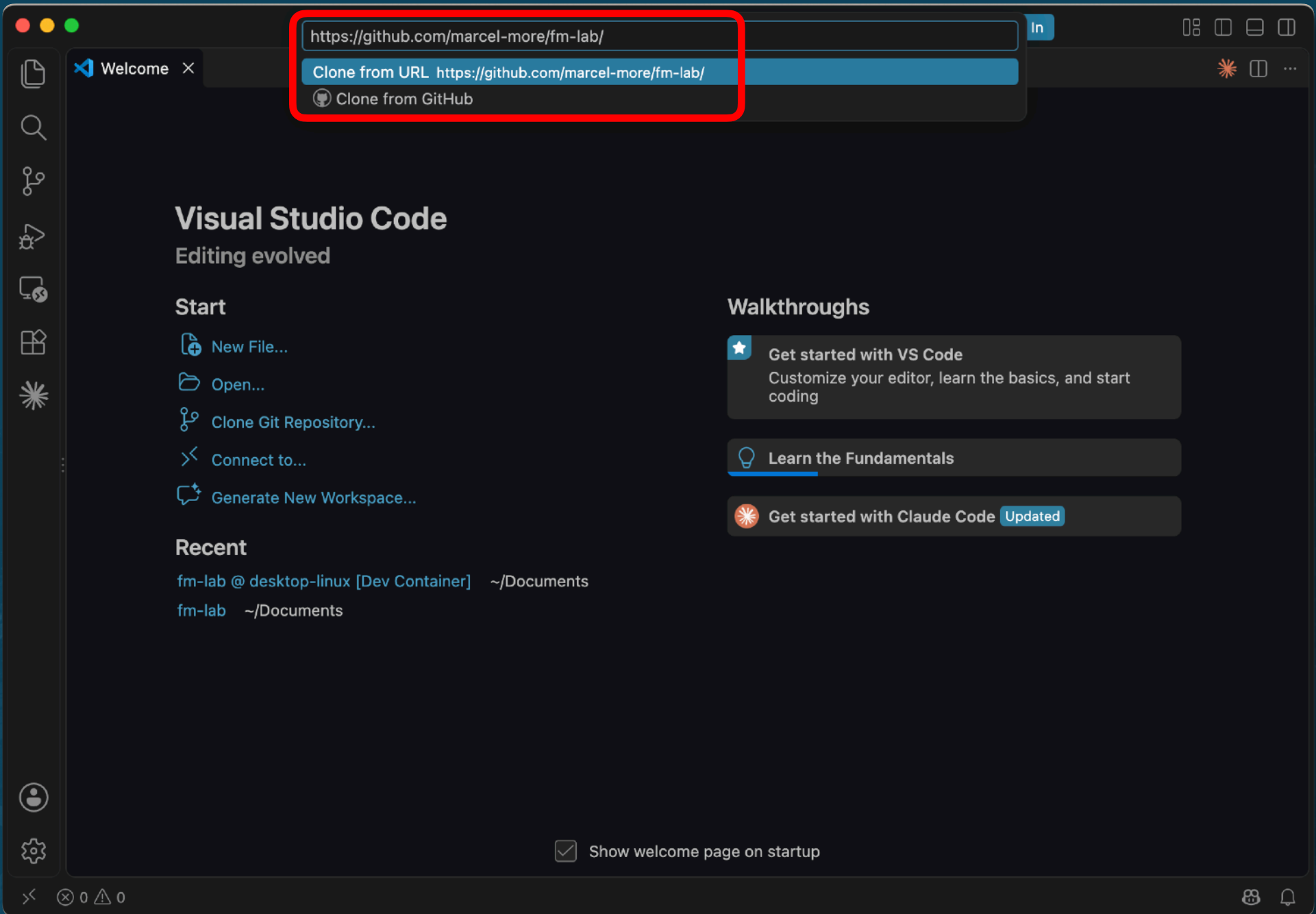


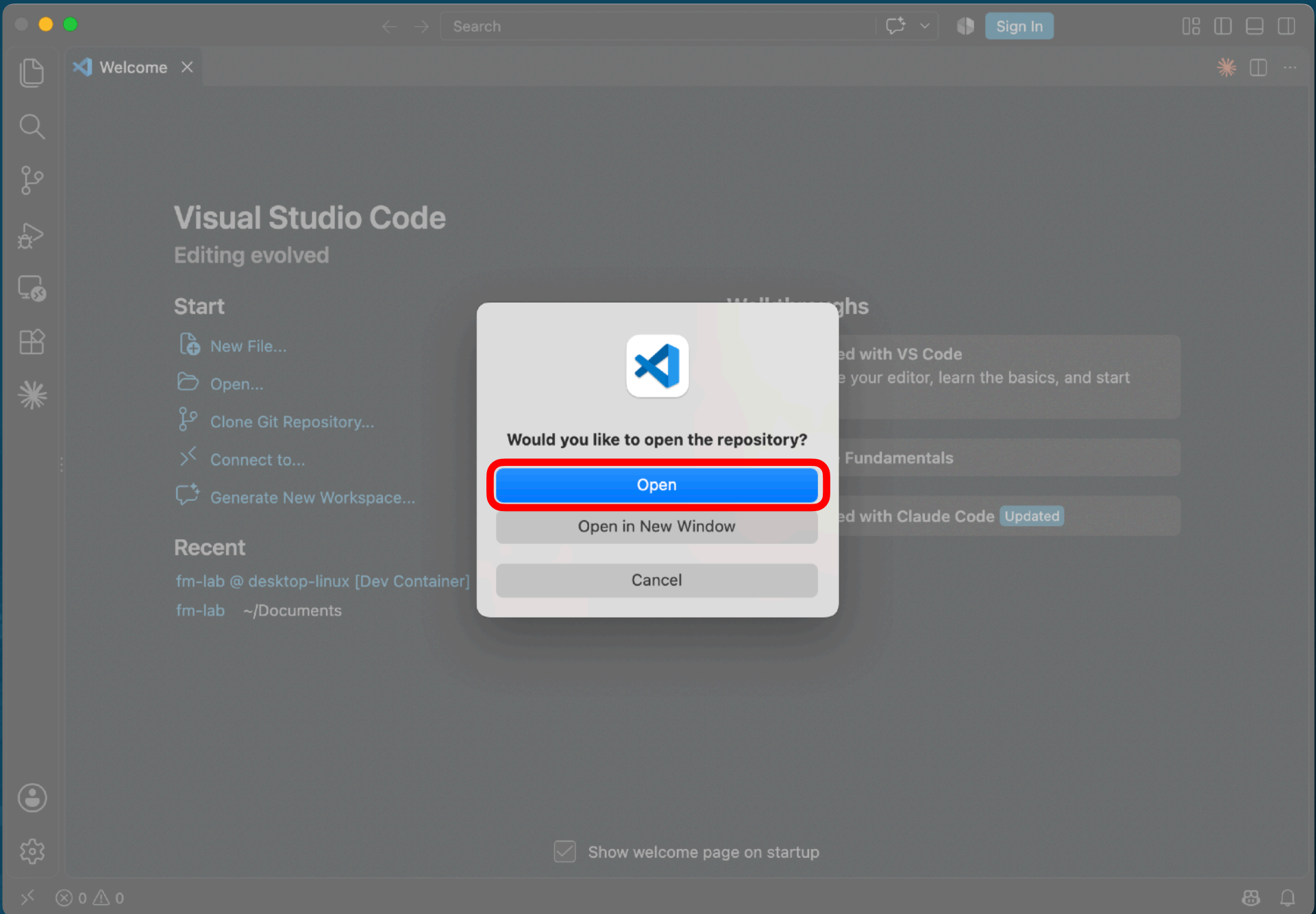
Claude Sandbox

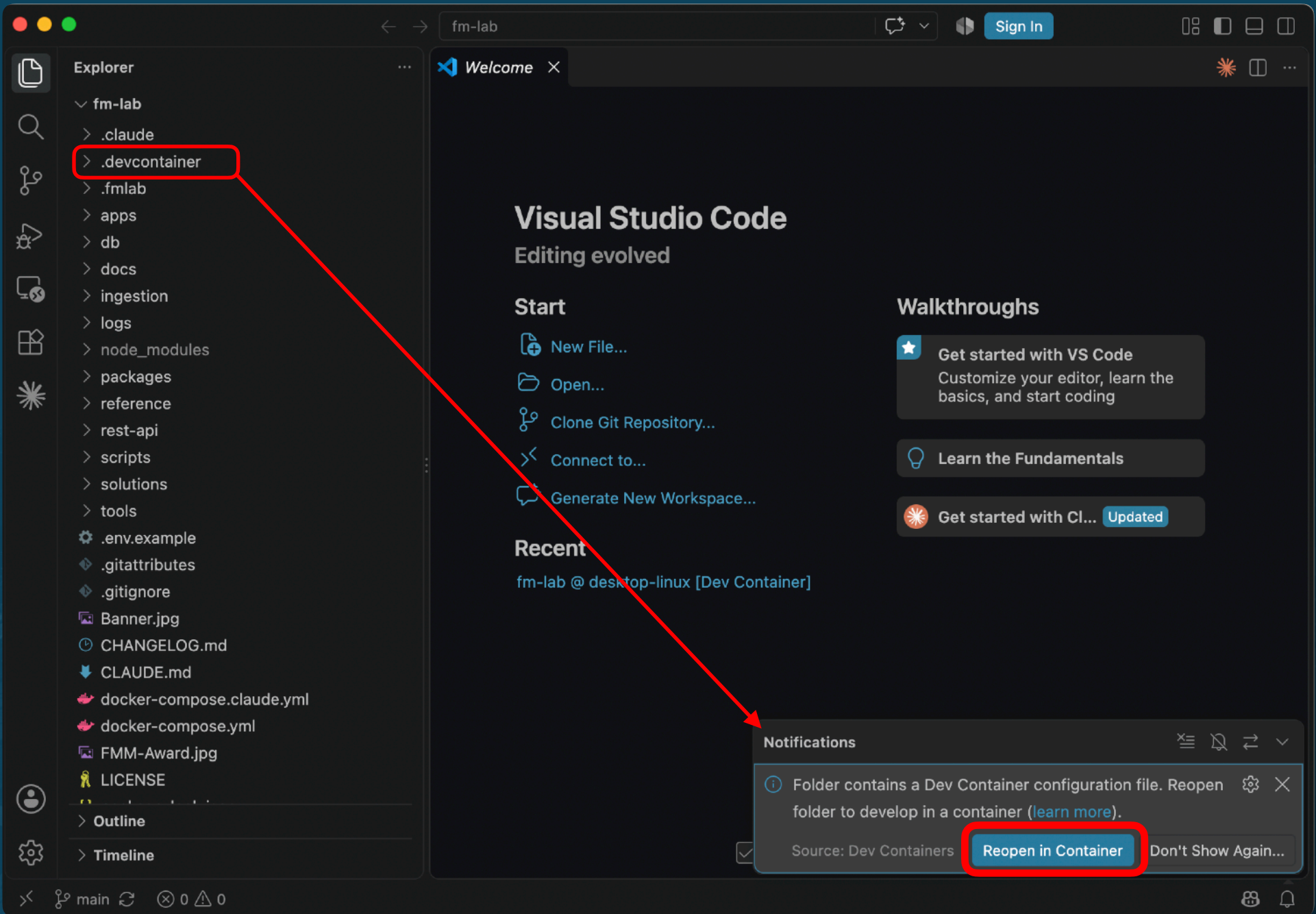
Easy setup

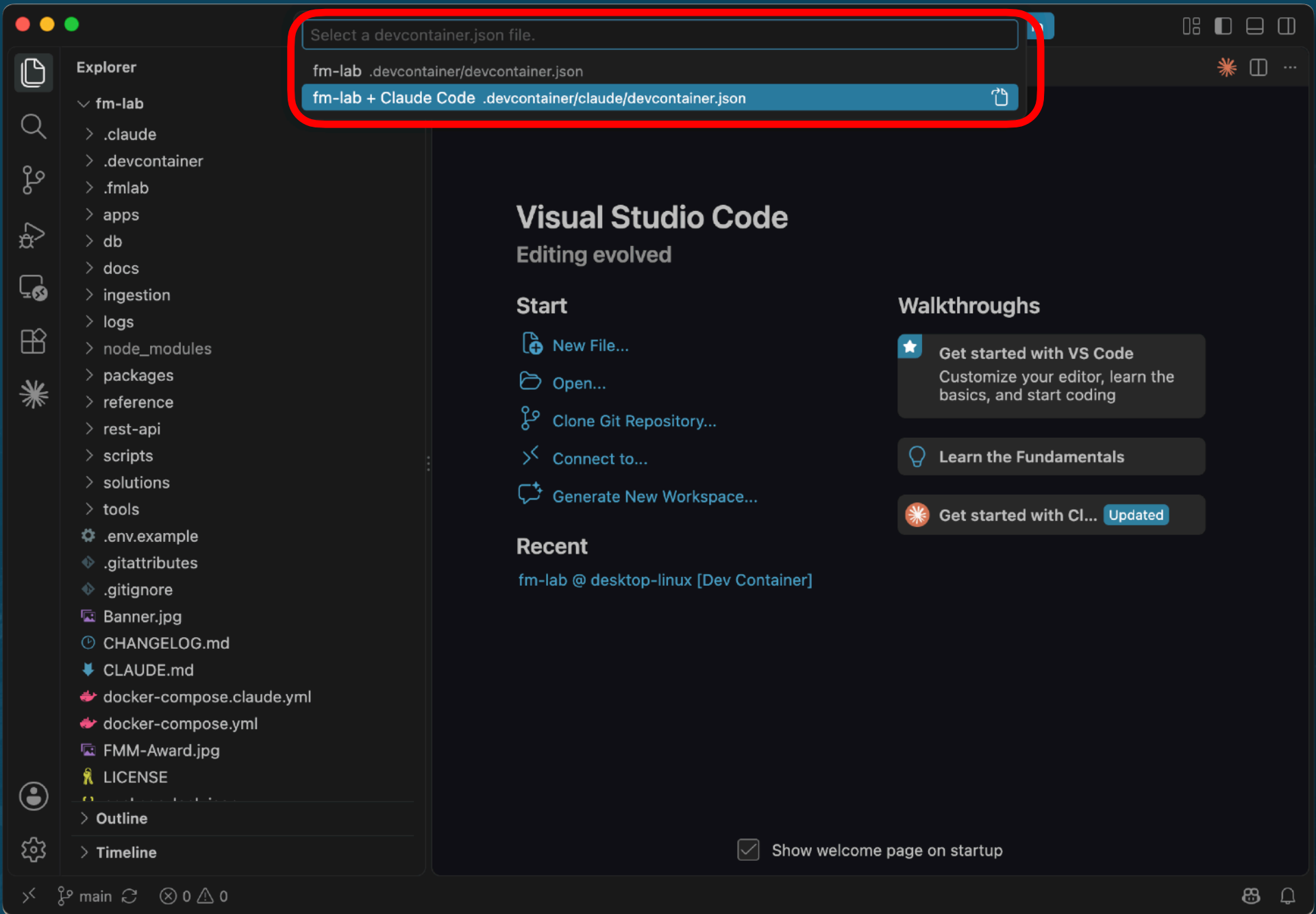












fm-lab [Dev Container: fm-lab + Claude Code @ desktop-...]

Sign In

Explorer

fm-lab [Dev Container: fm-lab + Claude Co...]

docs

ingestion

logs

node_modules

packages

reference

rest-api

scripts

solutions

tools

.env.example

.gitattributes

.gitignore

Banner.jpg

CHANGELOG.md

CLAUDE.md

docker-compose.claude.yml

docker-compose.yml

FMM-Award.jpg

LICENSE

package-lock.json

package.json

README.md

version.json

Outline

Timeline

package-lock.json (Working Tree)

```
{
  "name": "fm-lab",
  "version": "0.9.13",
  "lockfileVersion": 3,
  "requires": true,
```

Problems

Output

Debug Console

Terminal

Ports 10

Dev Conta...

Configurin...

Adding 172.67.72.239 for blobs.duckdb.org
Adding 104.26.15.99 for blobs.duckdb.org
Resolving help.claris.com...
Adding 2.21.245.139 for help.claris.com
Adding 2.21.245.149 for help.claris.com
Resolving www.monkeybreadsoftware.com...
Adding 92.205.199.26 for www.monkeybreadsoftware.com
Host network detected as: 172.18.0.0/24
Firewall configuration complete
Verifying firewall rules...
Firewall verification passed - unable to reach https://example.com as expected
Firewall verification passed - able to reach https://api.github.com as expected

Claude Code ready - saved login found (persisted from a previous sign-in).
Start the agent: `docker compose exec -it api claude`

REST-API (Port 3003)
✓ REST API started (PID 783)
✓ API responds - 59 tables loaded, uptime 1s

Frontend (Port 5173)
✓ Frontend started (PID 881)

Status
REST API: http://localhost:3003 (newly started)
Frontend: http://localhost:5173

Stop: tools/stop-servers.sh
API log: logs/rest-api.log
FE log: logs/frontend.log
Done. Press any key to close the te

ⓘ

Your application (Web-Frontend) running on port 5173 is available. [See all forwarded ports](#)

Open in Browser

Preview in Editor

Dev Container: fm-lab + Claude Code @ de...

main

0 0 11

Ln 3, Col 1

Spaces: 2

UTF-8

LF

{ } JSON

Prettier

localhost

English

FM-Lab Browser

SearchHierarchyAtlas

Search by name:
e.g. Import, Email (empty = all objects)

File:
All files

Object type:
All types

Options...

No data yet. Drop your FileMaker XML export into the "xml/" folder and start the conversion.

- Export from FileMaker Pro via "File ▶ Save a Copy as XML" — enable "Include details for analysis tools".
- Put the files into this folder on the host — it is mounted into the container.

/Users/test/Documents/fm-lab/solutions/default/xml

Copy path

Dashboards161

Prepared analyses

Custom queries30

Reusable SQL templates

Tests27

Curated analysis tests

Docs1

Installed documentation sources

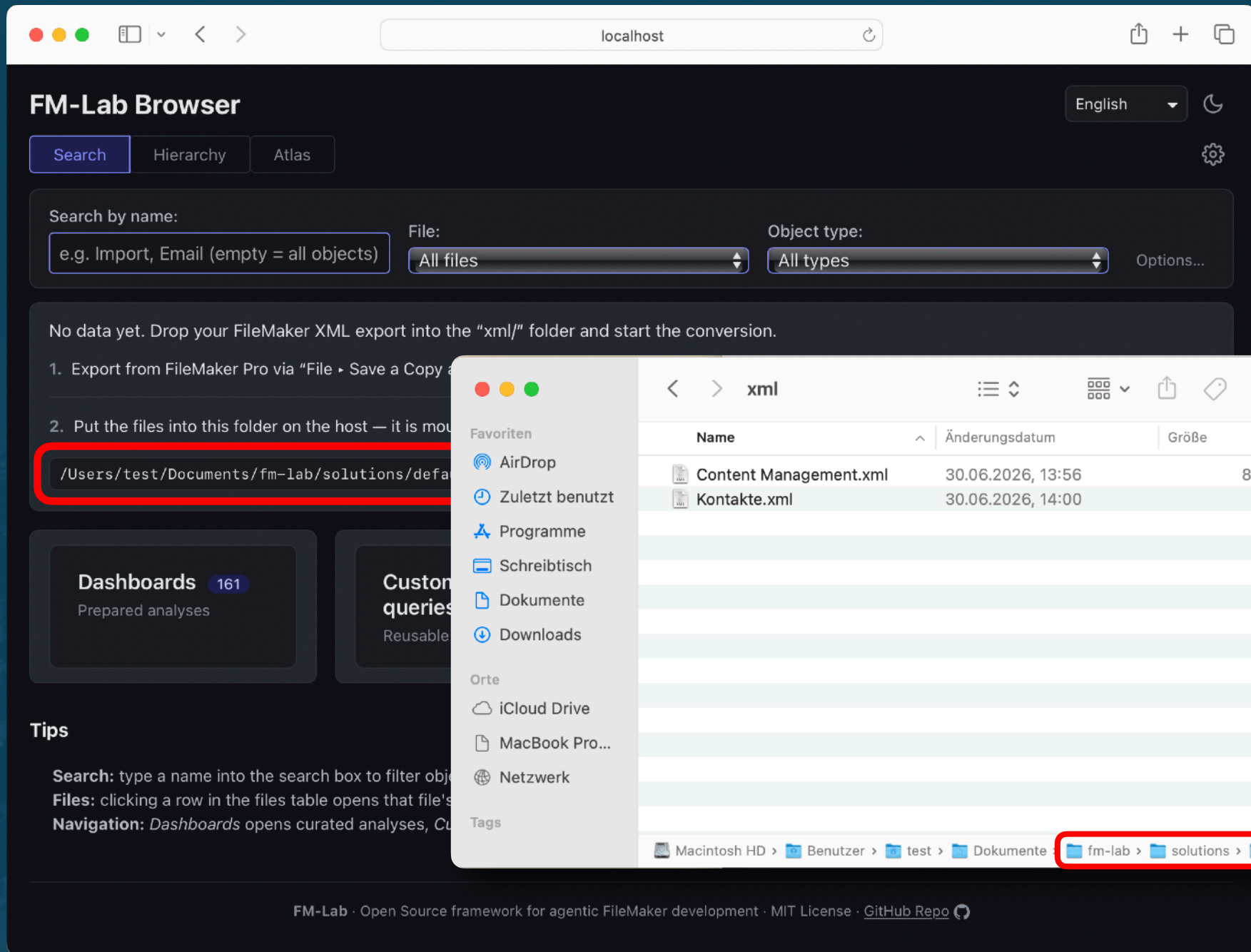
Tips

Search: type a name into the search box to filter objects — the dashboard hides automatically.

Files: clicking a row in the files table opens that file's detail view.

Navigation: *Dashboards* opens curated analyses, *Custom queries* lists every reusable SQL template, *Docs* shows installed documentation sources.

FM-Lab · Open Source framework for agentic FileMaker development · MIT License · [GitHub Repo](#)



localhost

English

FM-Lab Browser

SearchHierarchyAtlas

Search by name:
e.g. Import, Email (empty = all objects)

File:
All files

Object type:
All types

Options...

2 XML file(s) found • 1.8 MB

Convert XML

Dashboards161

Prepared analyses

Custom queries30

Reusable SQL templates

Tests27

Curated analysis tests

Docs1

Installed documentation sources

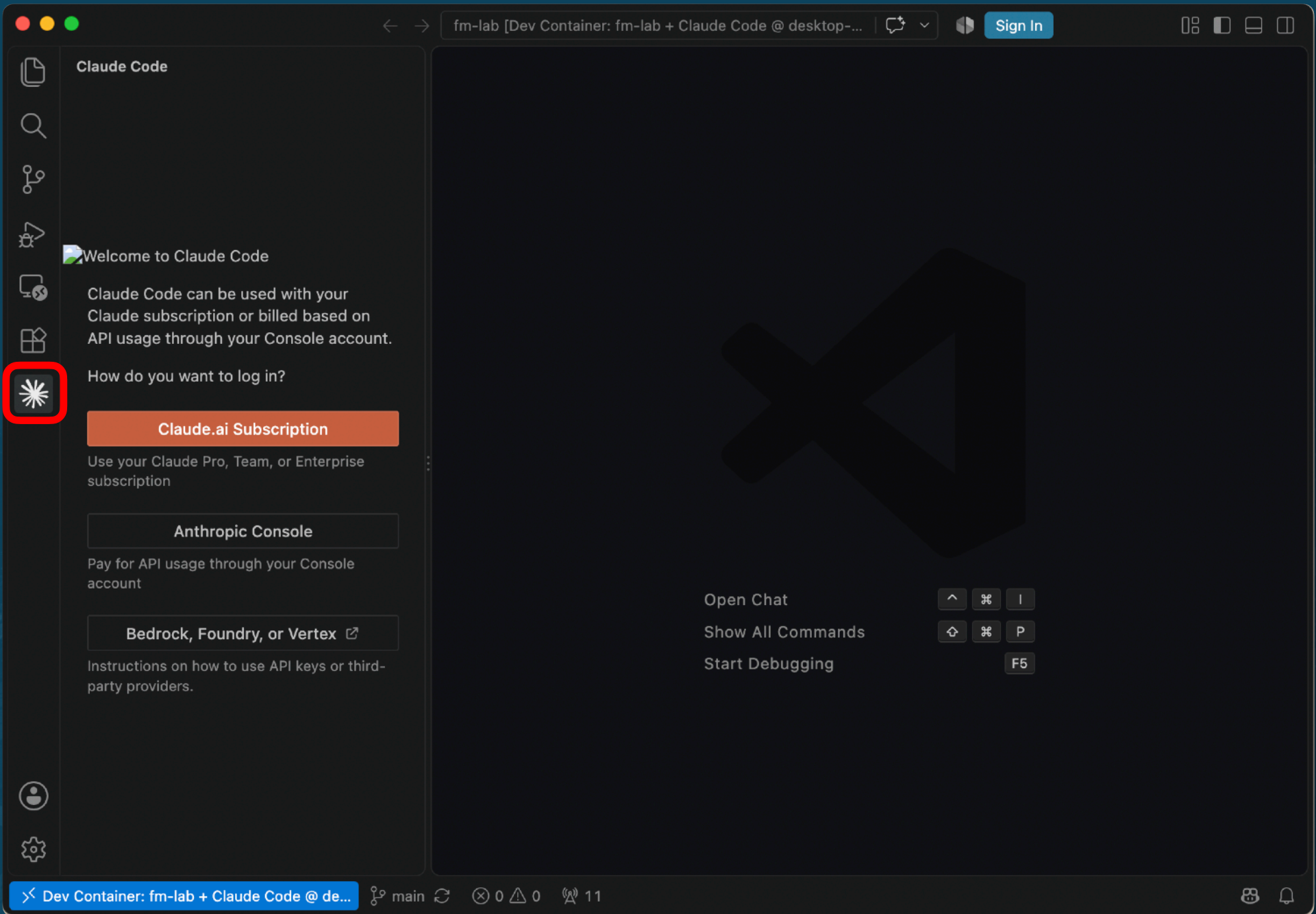
Tips

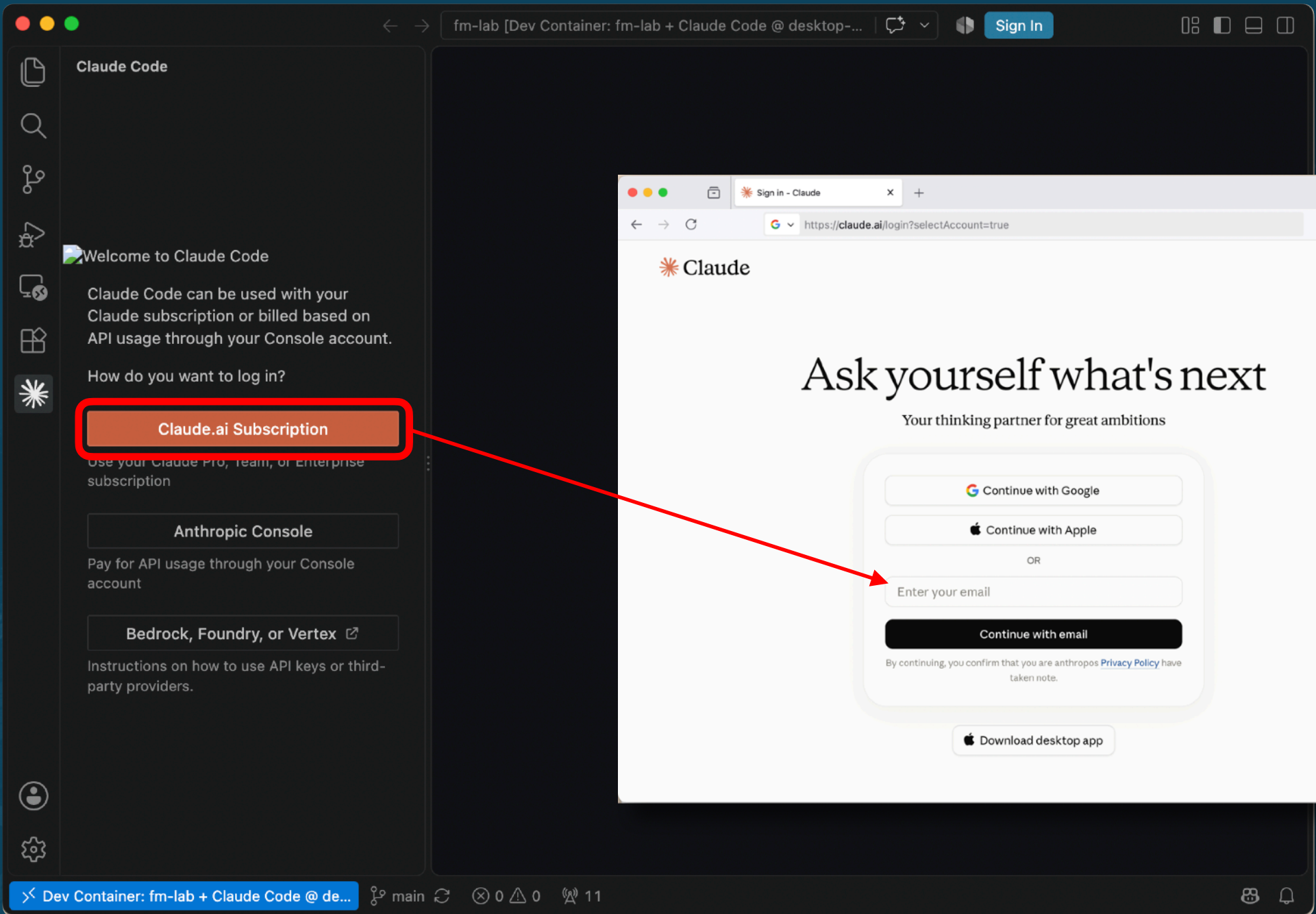
Search: type a name into the search box to filter objects — the dashboard hides automatically.

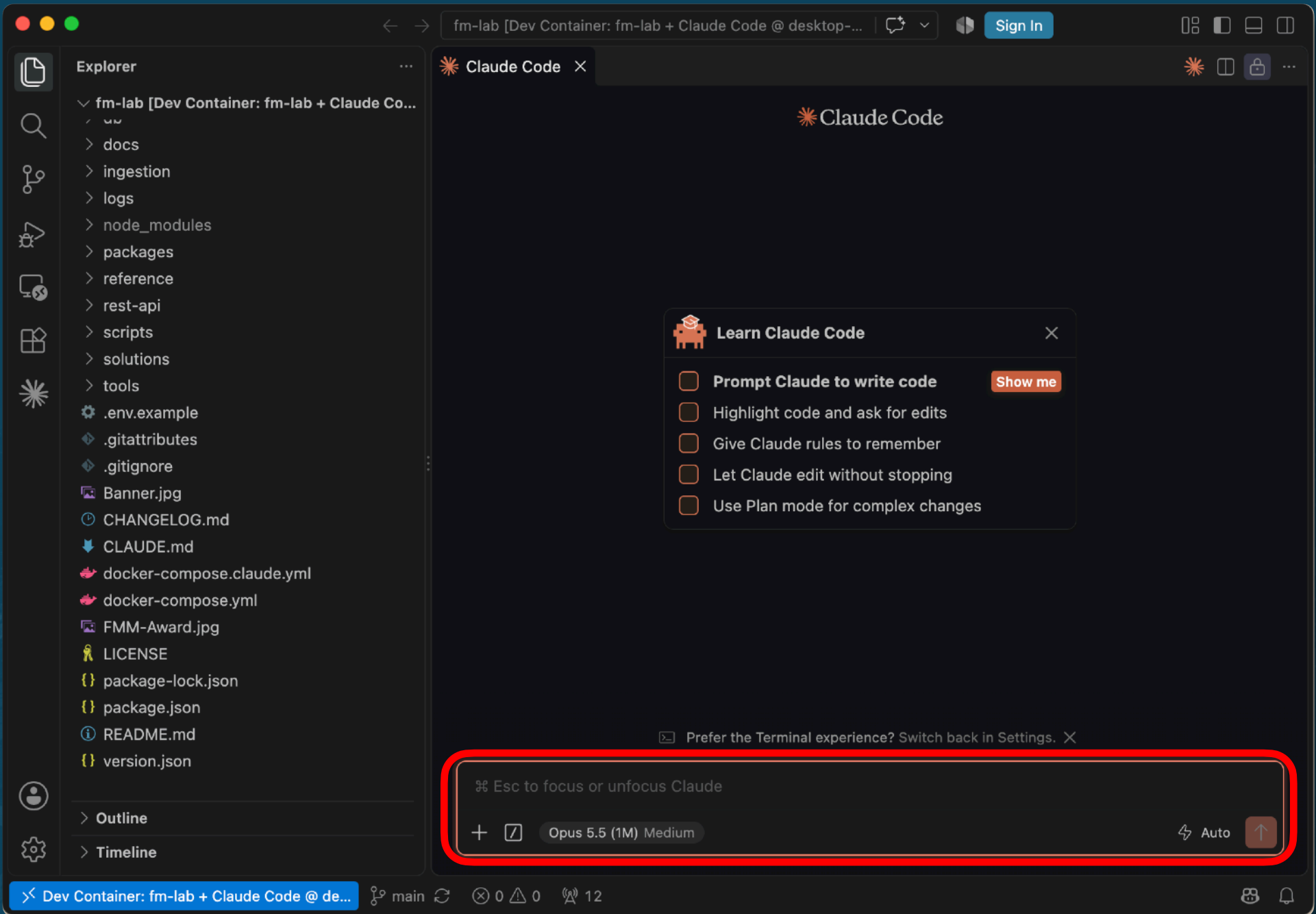
Files: clicking a row in the files table opens that file's detail view.

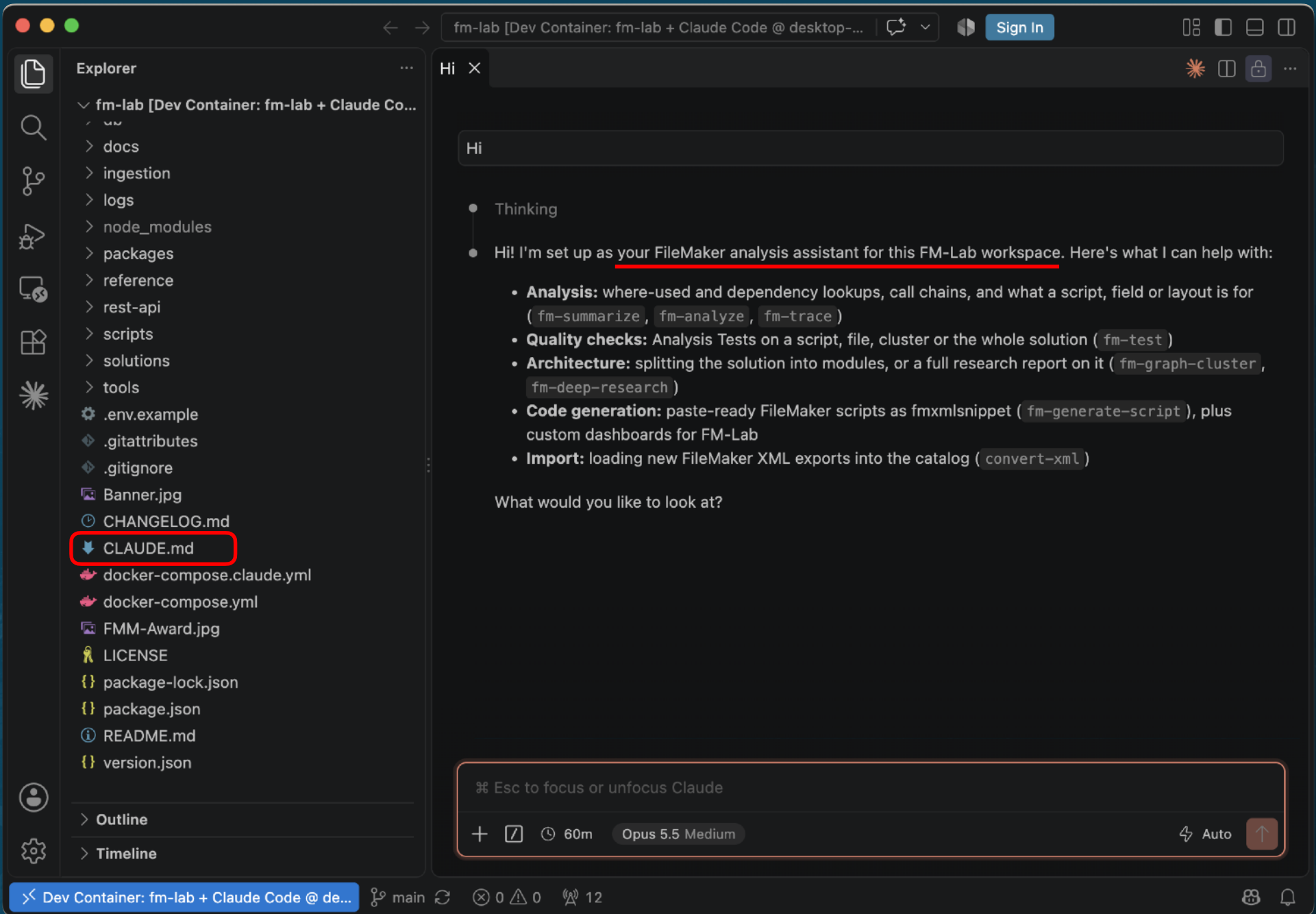
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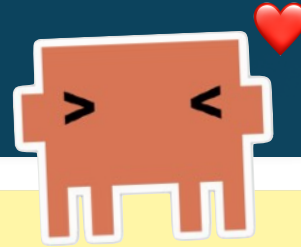








Feel the difference



“Using agentic analytics with FM-Lab feels less like searching through metadata and more **like asking a senior developer** who already understands the structure of the solution in every little detail.”

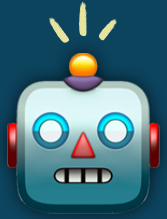


An aerial night view of a city, likely Copenhagen, featuring a river (Nørrebro) and several modern skyscrapers (the 'Copenhagen Towers') on the right. The city lights are visible in the background, and the foreground shows a mix of older buildings and modern architecture.

Conclusion

Why the harness matters

Why the harness ?



The future of agentic development
isn't just smarter models.



It's giving them a world
they can actually understand.

Structure → Meaning → Tools → Action

Key Success Factors

| **Structure as knowledge**
data-driven knowledge graph

| **Speed at scale**
DuckDB analytical engine

| **Meaning over raw data**
semantic layer

| **Built to evolve**
modular architecture

| **Rules over guessing**
skills + machine-readable specs



An aerial, grayscale photograph of a cityscape. A wide river flows through the center, with a bridge visible in the distance. On the right side, several tall, modern skyscrapers with grid-like window patterns stand out. The left side shows a dense urban area with lower-rise buildings. The sky is overcast with soft clouds.

Thank you!

Q&A



