

embarcadero® Product Address

Stephen Ball & Jim McKeith



CONFERENCE
EMBARCADERO CONFERENCE 2022

Your Presenters



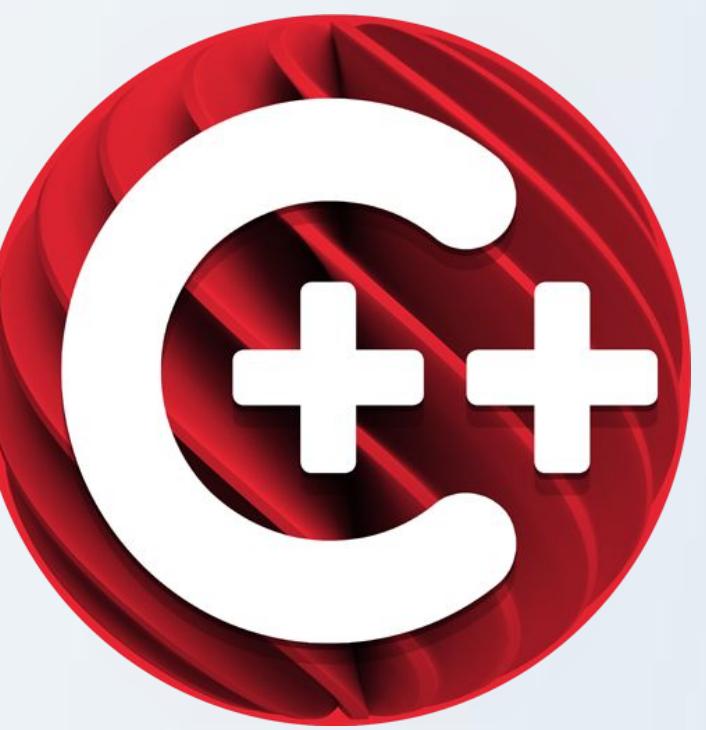
- Embarcadero's Chief Developer Advocate & Engineer
 - Managing MVPs & Tech Partners
- Long time software developer in many languages
 - Delphi, Python, C++, JavaScript, Java, Python, etc.
- Invented and patented pattern and swipe to unlock
 - US Patent # 8352745 & 6766456, etc.
- Built thought controlled drone with Google Glass
- Lives near Boise, Idaho, USA
- Contributor to *Internet of Things and Data Analytics Handbook*



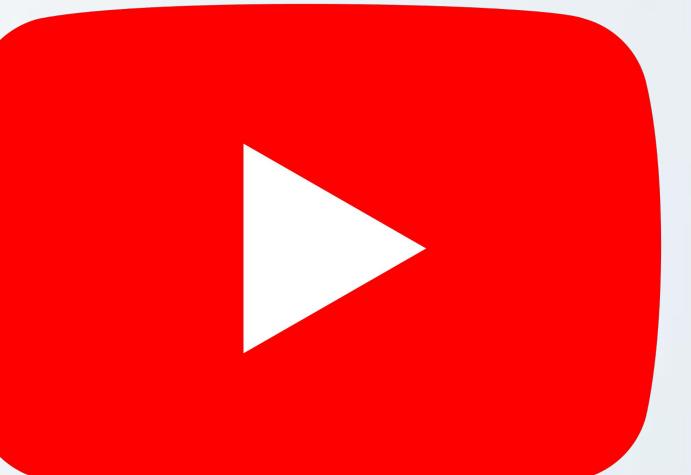
- Idera (Developer Tools) Presales Director
 - Multi-national team spans 10 brands.
- Co-Invented of InterBase's patented ChangeViews technology
- Chartered IT Professional
- Also a National League Basketball Referee
- Lives near Bracknell, Berkshire, UK.

RAD Studio Landscape

- **Engaged and Growing community**
 - Coding Boot Camp very successful
 - 8000 registrants!
 - 330 MVPs & Tech Partners
 - Many online communities
 - Continued growth in webinar attendance
 - Return to in-person events with high attendance
- **New audiences**
 - New developers, and younger developers
 - Bringing VCL & FMX to Python
 - Introducing Python developers to Delphi
 - Simultaneously streaming to Youtube and Facebook



LearnDelphi.org



RAD Studio 11.0 Summary

Large Focus on IDE

- IDE High DPI and High DPI enabled form designer
- VCL styles in VCL designer; improvements to FMX designer and Multi-window design/code for a unit
- LSP quality and new C++ code formatter
- New Welcome page
- Visual Studio Code LSP support
- Minimal installer improvements

Delphi and C++ compilers and toolchains

- C++ Quality: RTTI (components); exception handling
- Delphi macOS 64 ARM (M1) compiler and toolchain
- Minor Delphi language improvements

Libraries Improvements

- Delphi RTL quality: TZipFile, 64-bit data structures, Bluetooth LE
- VCL Modernization work
- Better FMX High DPI on Windows and desktop integration, including WebView 2
- Android API 30 support and related work

Additional Delphi Platforms

- Support for WSL 2 (Windows Subsystem for Linux)
- Including WSLg (Linux GUI) on Windows 11

RAD Studio 11.1 Summary

Focus on Quality and Improvements

- Usability, performance, stability
- Some new small IDE features

Better Code Insight and LSP

- For both languages, Delphi and C++

Platforms and Tooling

- Official support for Windows 11, macOS 12 Monterey, iOS 15, and Android 12

Libraries

- Performance and quality improvements and small additions to Delphi RTL, database libraries, VCL, FireMonkey

RAD Studio 11.2: iOS Simulator & Quality / Polish

Focus on Quality and Improvements

- IDE and Designer High DPI
- Usability / 'The Small Things' Quality

IDE Improvements

- CPU View Syntax Highlighting
- Markdown Support
- Editor Tab Improvements
- Fonts and Styles

Code Insight / DelphiLSP

- Reworked Help Insight (and using XSLT again)
- Marking Inactive Code and Color Constants
- C++ Code Insight from 11.1.5

Platforms and Tooling

- iOS Simulator for Delphi
- LLDB for Linux
- Android Target API 32
- Remote Debugging Win64 C++

Libraries

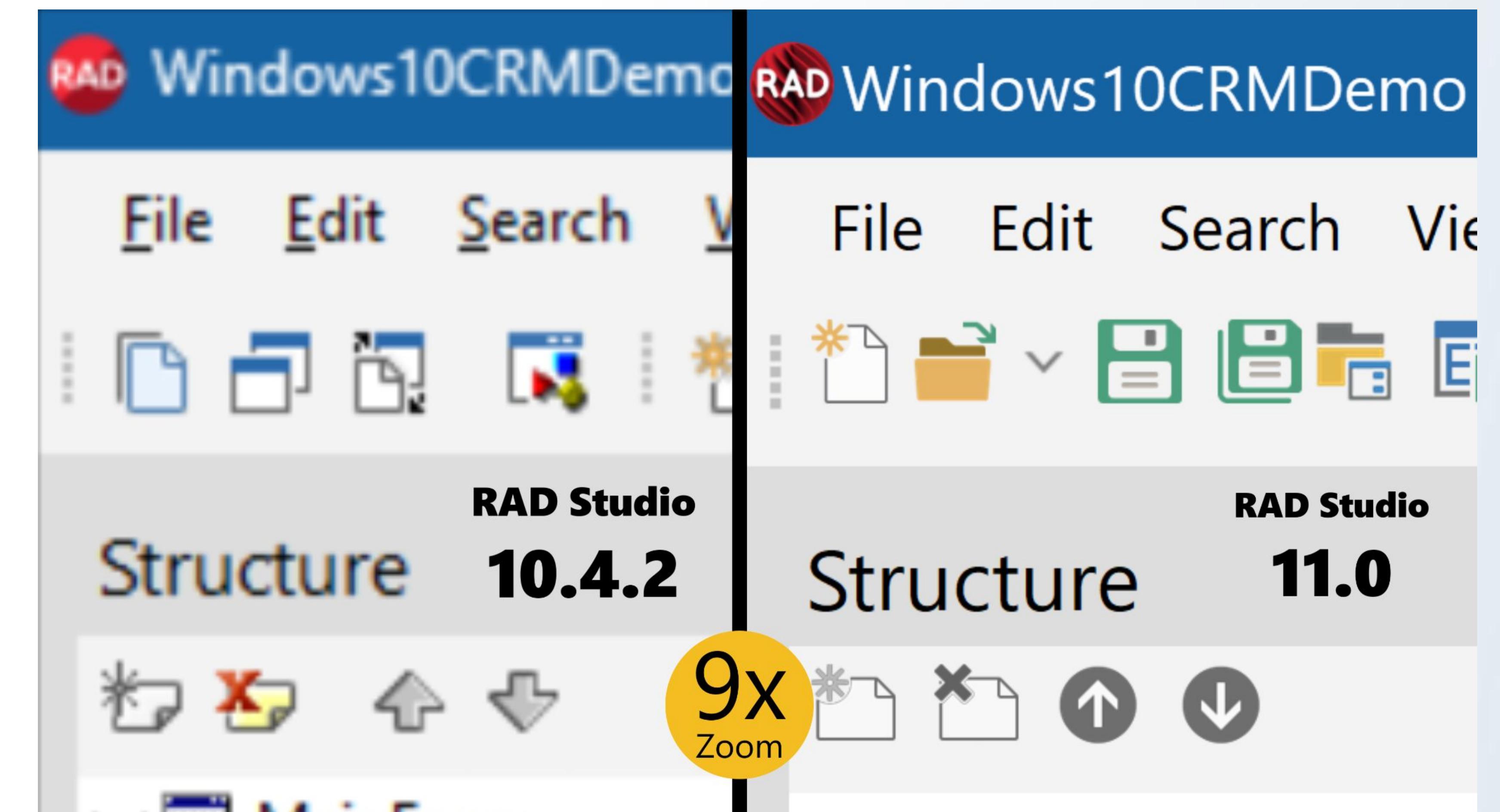
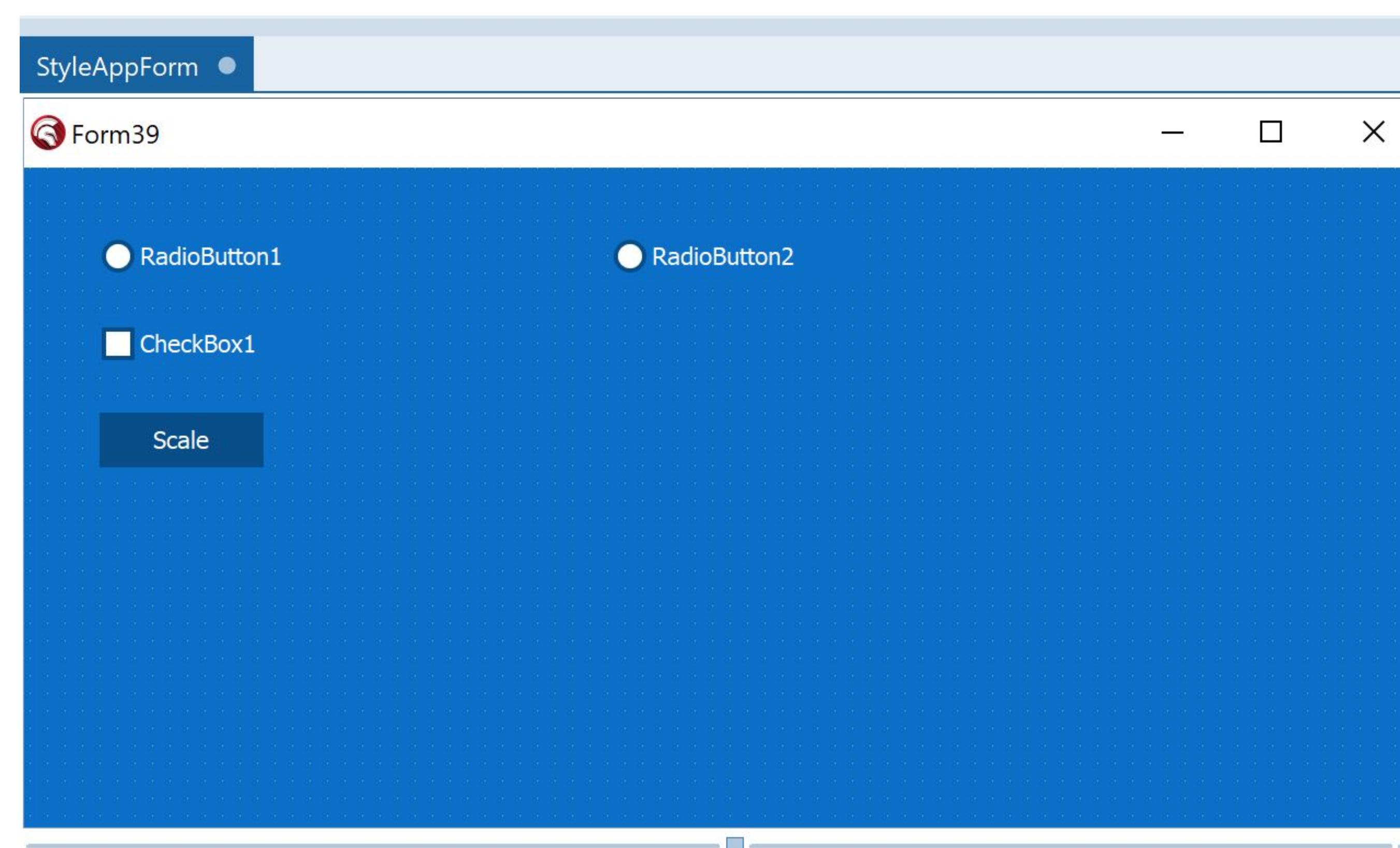
- VCL WebView2 Improvements
- General VCL and FMX Quality
- ZLib, HTTP / REST
- RAD Server
- FireDAC reFind, Updated Drivers, and FDMonitor/FDExplorer

Why the Small Things Matter



11.0 and 11.1: IDE and Designers

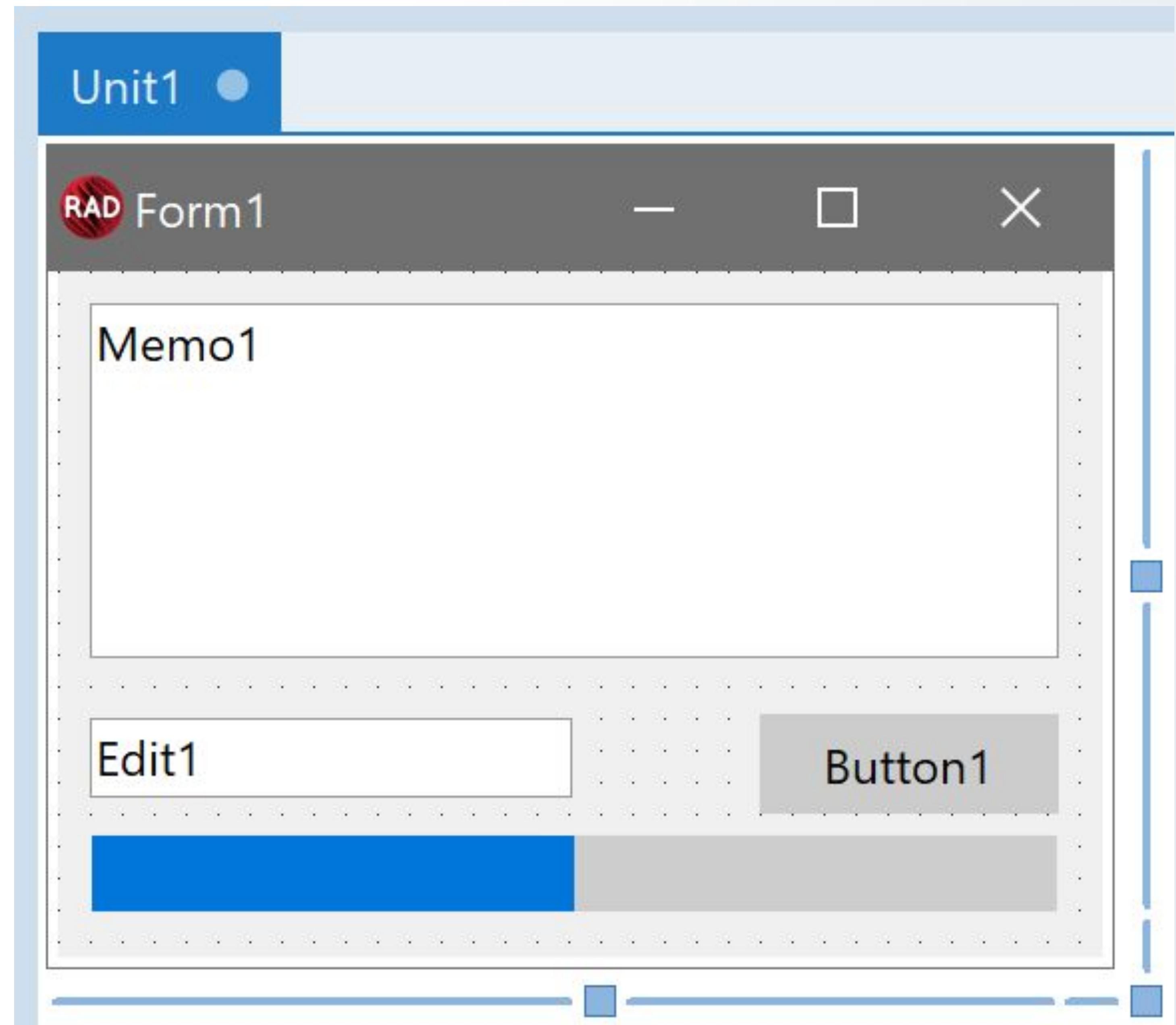
- High DPI IDE
 - Crisp fonts in all windows and the editor
- High DPI enabled form designer
- Multiple Active Styles in VCL Designer



11.2: IDE Designers

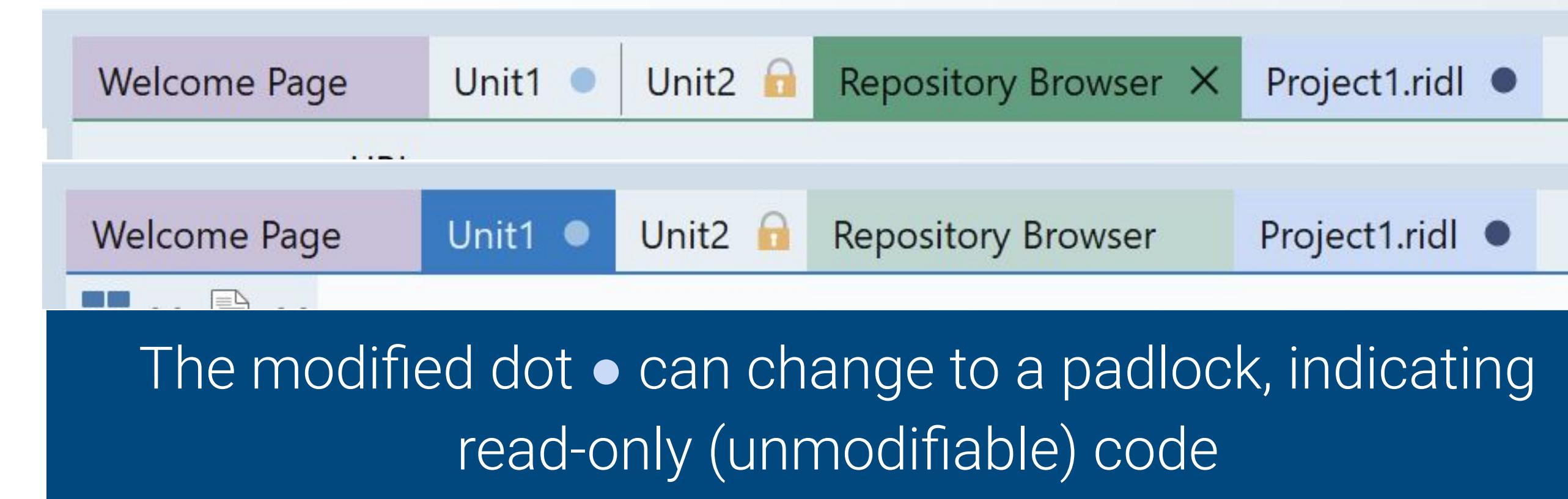
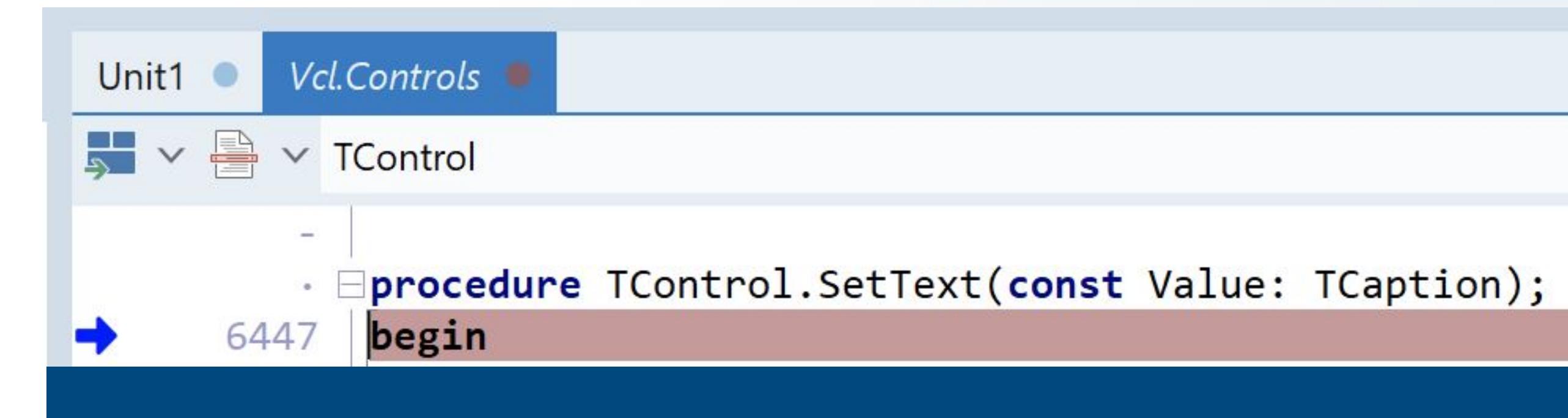
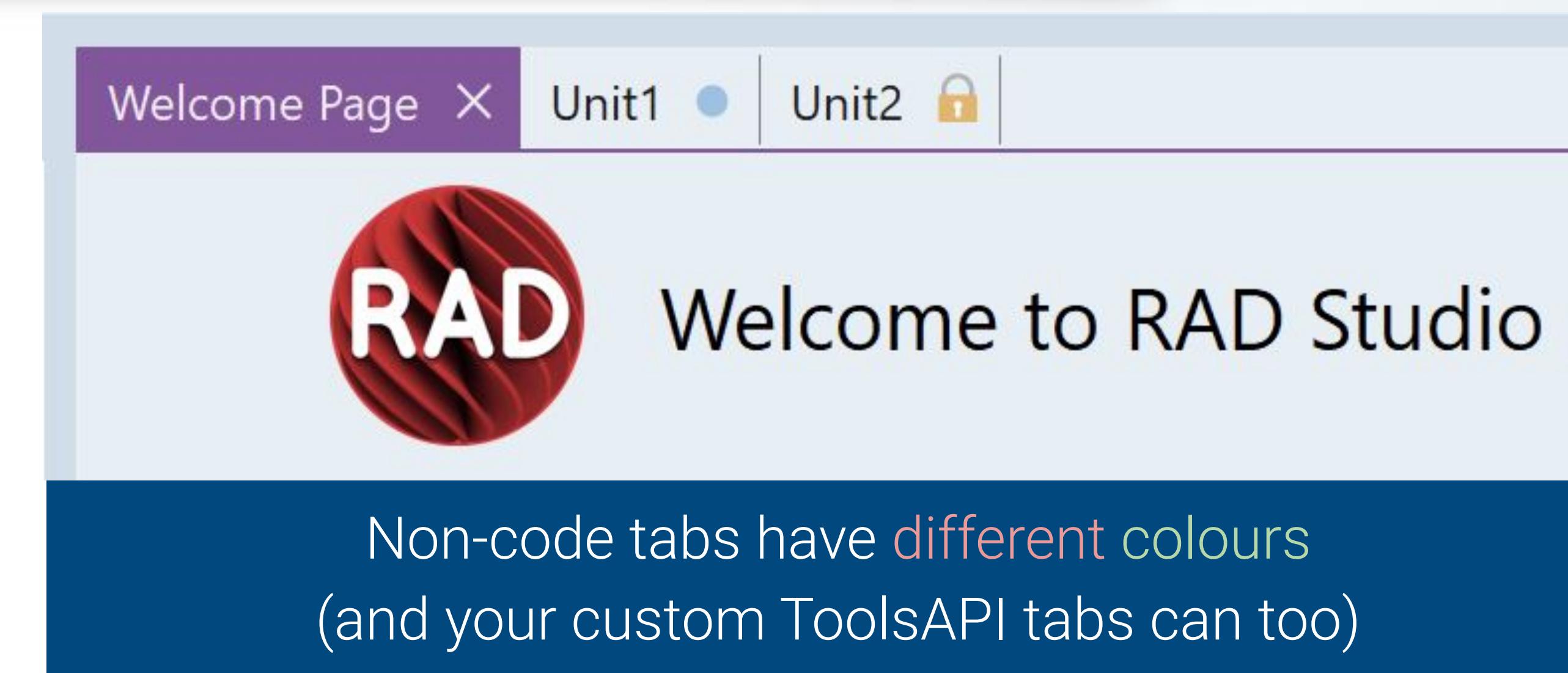
- High DPI Quality improvements
 - Many areas, many windows: overall quality
 - VCL Designer has many High DPI fixes

- VCL Designer uses styles by default
 - In 11.0, added optional (off by default) styles in the designer, including multiple styles at once, just like apps
 - In 11.2, this is on by default, and a special design style is used at designtime



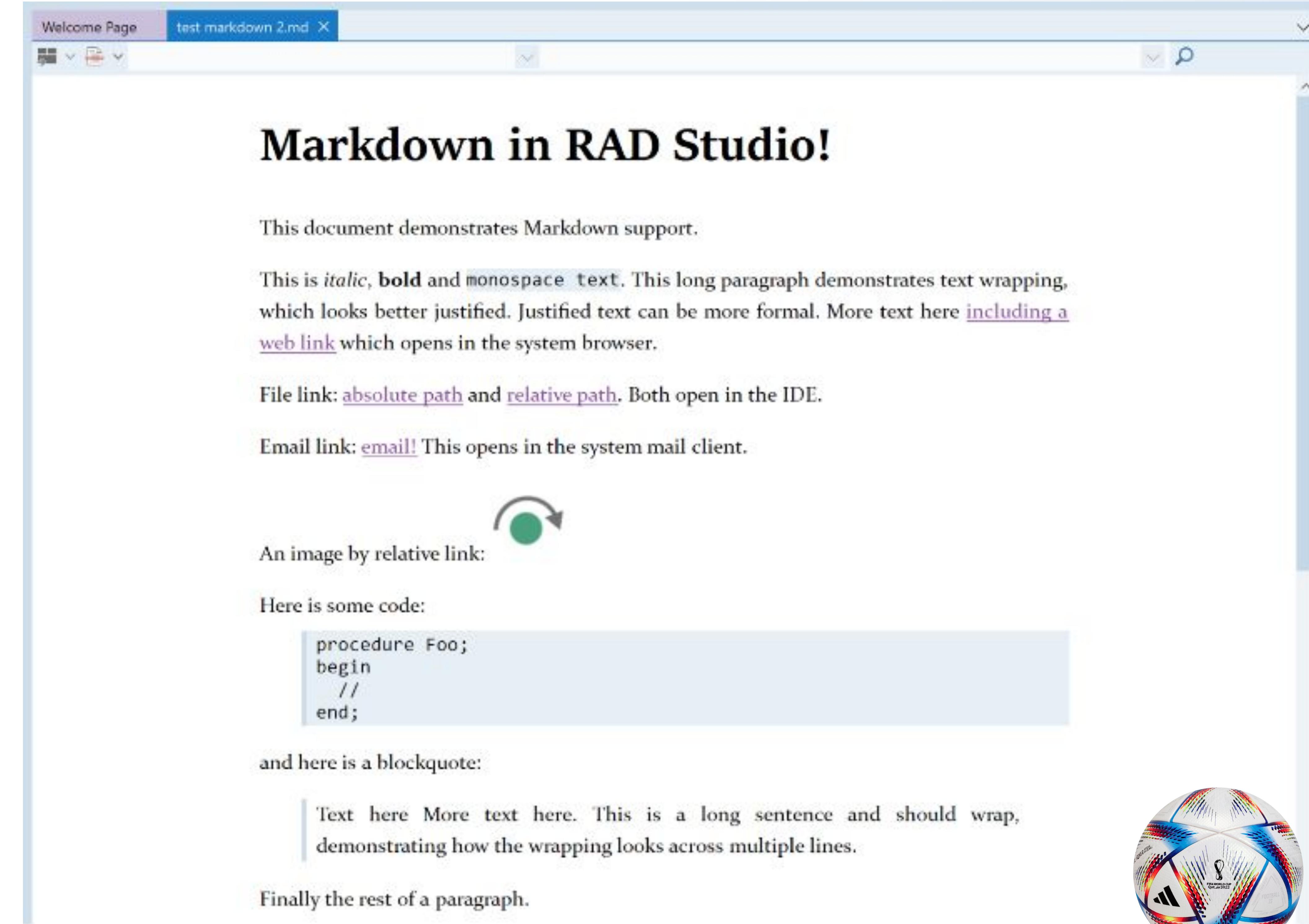
11.2: IDE - Tab State Visualization

- Some tabs are different to other tabs:
 - Some have *different, non-code functions*, eg the Welcome Page, Type Library editor, source control tabs
 - Some code is *opened while debugging*
 - Some code is *read-only*
- In the past, we indicated modified code with a dot in the tab
 - **In 11.2, we add symbology for all the above as well.**
Helps visual navigation
- Plus, the X to close is now configurable: off entirely, on the active tab, or on all tabs



11.2: Markdown and HTML

- Markdown is a common human-readable ‘markup’ (formatting) format
- Most GitHub readmes are Markdown
- IDE supports Markdown documents, richly formatted: headings, links, images, code, etc
- Rich HTML returns as well
- HTML and MD editable in code editor
- Project readmes can be Markdown
- No Internet Explorer in the IDE any more!
Pure VCL implementation



The screenshot shows the RAD Studio IDE interface with a Markdown file named "test markdown 2.md" open. The window title is "Welcome Page" and the tab title is "test markdown 2.md". The content of the file is:

Markdown in RAD Studio!

This document demonstrates Markdown support.

This is *italic*, **bold** and monospace text. This long paragraph demonstrates text wrapping, which looks better justified. Justified text can be more formal. More text here [including a web link](#) which opens in the system browser.

File link: [absolute path](#) and [relative path](#). Both open in the IDE.

Email link: [email!](#) This opens in the system mail client.

An image by relative link: 

Here is some code:

```
procedure Foo;
begin
  //
end;
```

and here is a blockquote:

Text here More text here. This is a long sentence and should wrap, demonstrating how the wrapping looks across multiple lines.

Finally the rest of a paragraph.



11.2: HelpInsight

- The return of XSLT!
- Effectively, Help Insight as it was pre-11.0
- Full XmlDoc info
- Can be customised by editing XSLT file (eg, as Documentation Insight does) and CSS
- Contains links to navigate

```
if (GetWindowLong(Handle, GWL_EXSTYLE) and WS_EX_TOPMOST <> 0) and
(
  function Winapi.Windows.GetWindowLong(hWnd: HWND; nIndex: Integer): Integer - Winapi.Windows.pas \(42293\)
)
Ap
else
begin
  PT
  Re
end;
```



11.2: Delphi: see Inactive Code in the editor

- A common customer request!
- Not all code is compiled:
it is often {\$IFDEF ...}-ed out.
- Code that is not compiled = inactive
 - Now, inactive code will be drawn in a faded semi-transparent color
- Other markup, like matching braces or selections, still drawn for inactive code
 - but also a different color
- This can be turned off or the transparency edited in the registry

```
uses
  FMX.Platform,
{$IF DEFINED(ANDROID) OR (DEFINED(IOS))}
  FMX.DialogService.Async
{$ELSE}
  FMX.DialogService.Sync
{$ENDIF}
;

if Addr = 0 then
  Result := 'Nil'
else
{$IFDEF AUTOREFCOUNT}
  Result := Format('%s@%8x(%d)', [ClassName, Addr, Instance.RefCount]);
{$ELSE}
  Result := Format('%s@%8x', [ClassName, Addr]);
{$ENDIF}
```



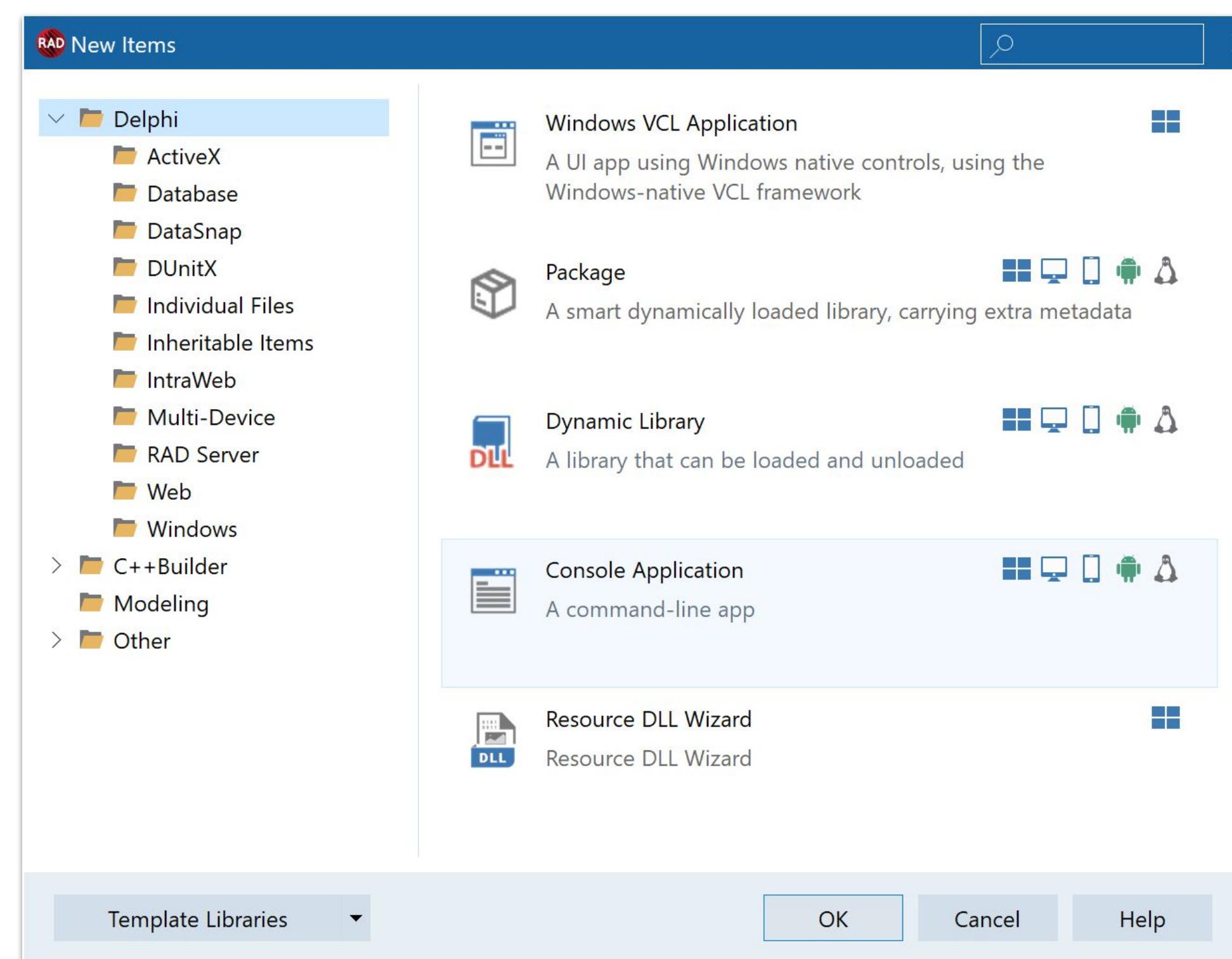
11.2: CPU Disassembly View

- When stepping into assembly code, syntax highlighting can help make it much easier to read
 - Match editor or IDE style colours

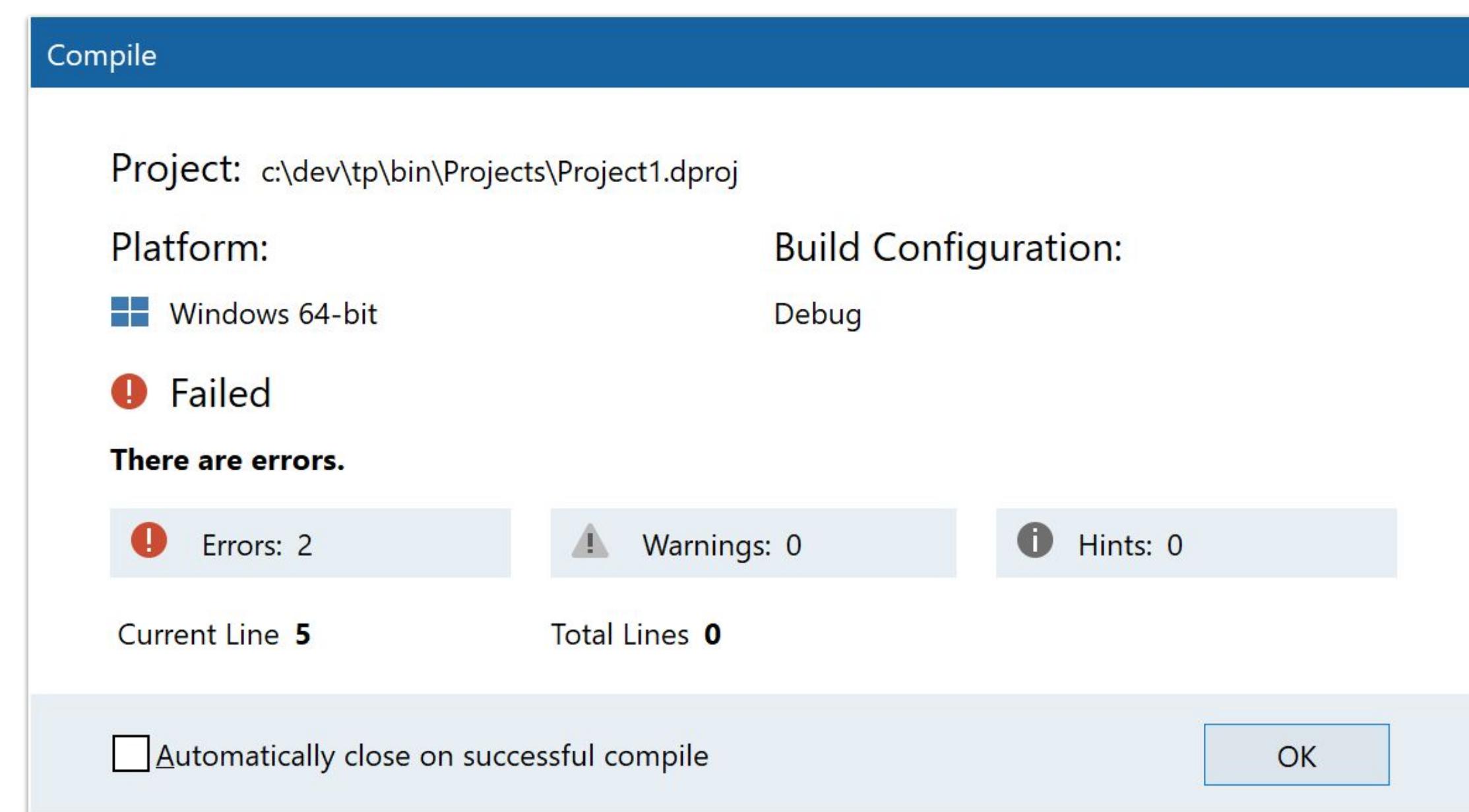


Other IDE Enhancements in 11.x

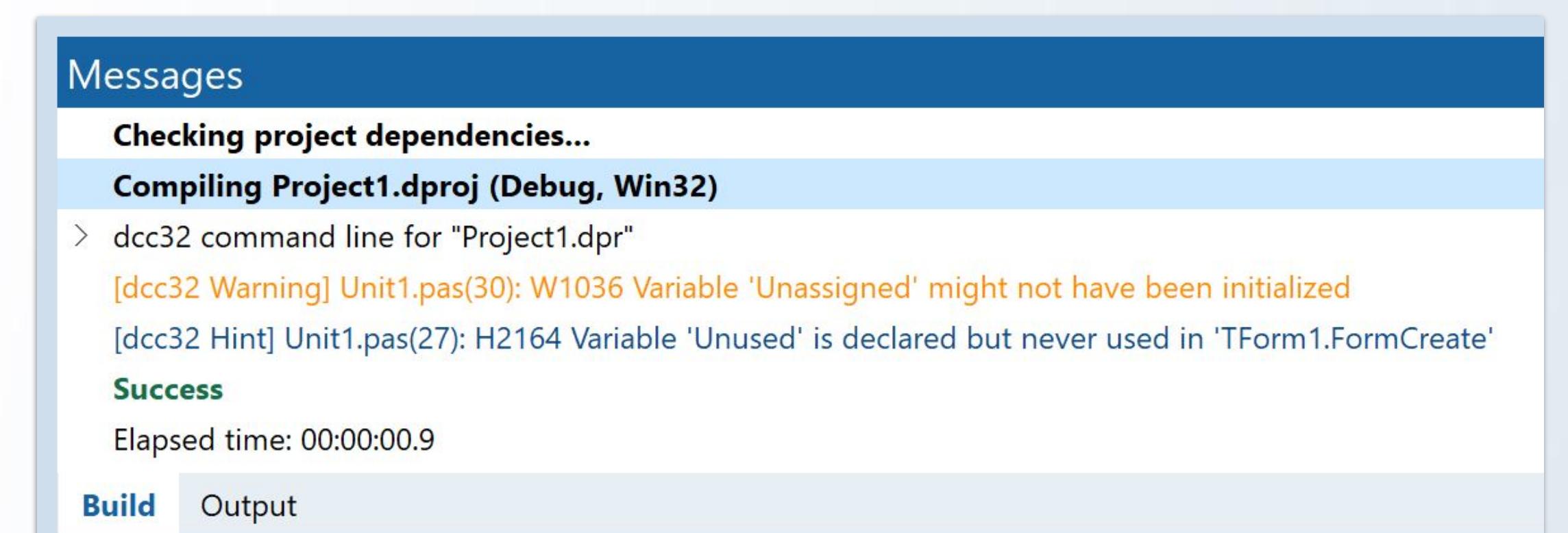
- New Items dialog: available platforms for each item
 - Also uses TControlList and offers other views
- 11.2: File > New, now shows “Data Module” as standard



- The Compile dialog shows the platform and build configuration



- Messages view: errors, warnings, and hints are differentiated by color (the colors can be customized)



11.2 FireDAC & Data



FireDAC SQL editor has syntax highlighting, line numbers, and common shortcut keys

RAD FireDAC Query Editor - [FDQuery1]

Setup query SQL, parameters, macros and options

SQL Command Parameters Macros Options

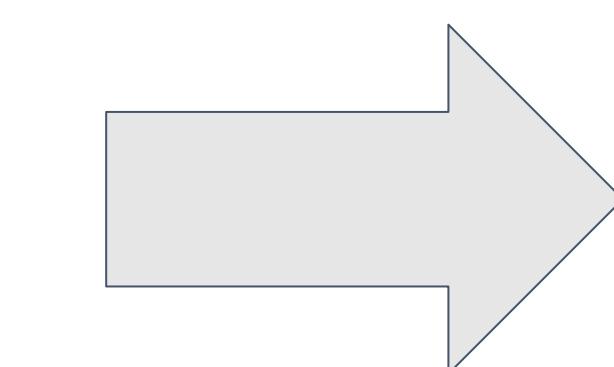
```
SELECT count(*), shipcountry
FROM orders AS O
INNER JOIN customers AS C ON
    O.customerid = C.customerid
INNER JOIN employees AS E ON
    O.employeeid = E.employeeid
GROUP BY shipcountry
ORDER BY 1 DESC
```

Execute Next RecordSet UpdateSQL Editor Auto Rollback

RecordSet Structure Messages

count(*)	ShipCountry
122	USA
122	Germany
83	Brazil
77	France
56	UK
46	Venezuela
40	Austria

OK Cancel



RAD FireDAC Query Editor - [SQLHighlighting]

Setup query SQL, parameters, macros and options

SQL Command Parameters Macros Options

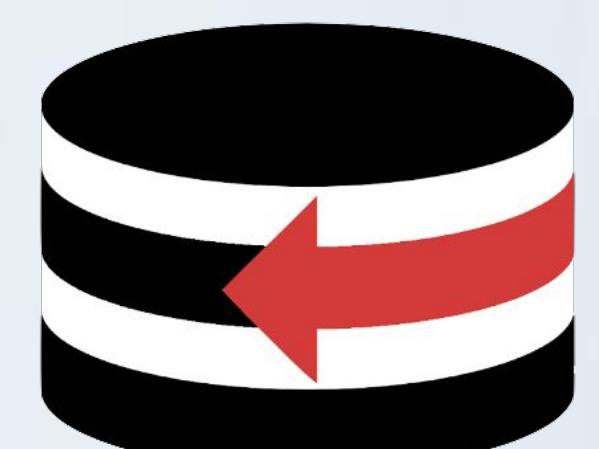
```
1 SELECT count(*), shipcountry
2 FROM orders AS O
3 INNER JOIN customers AS C ON
4     O.customerid = C.customerid
5 INNER JOIN employees AS E ON
6     O.employeeid = E.employeeid
7 GROUP BY shipcountry
8 ORDER BY 1 DESC
```

Execute Next RecordSet UpdateSQL Editor Auto Rollback

RecordSet Structure Messages

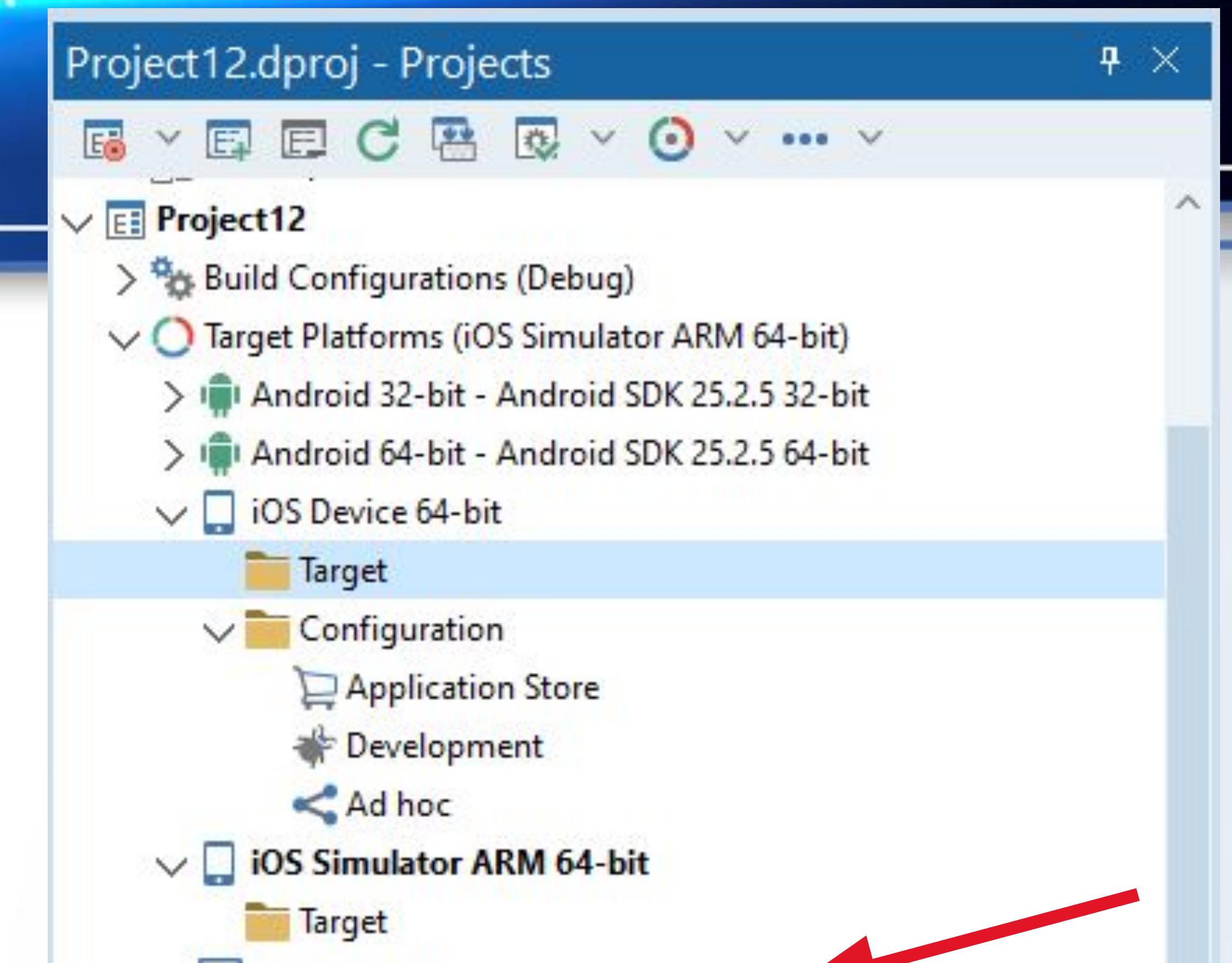
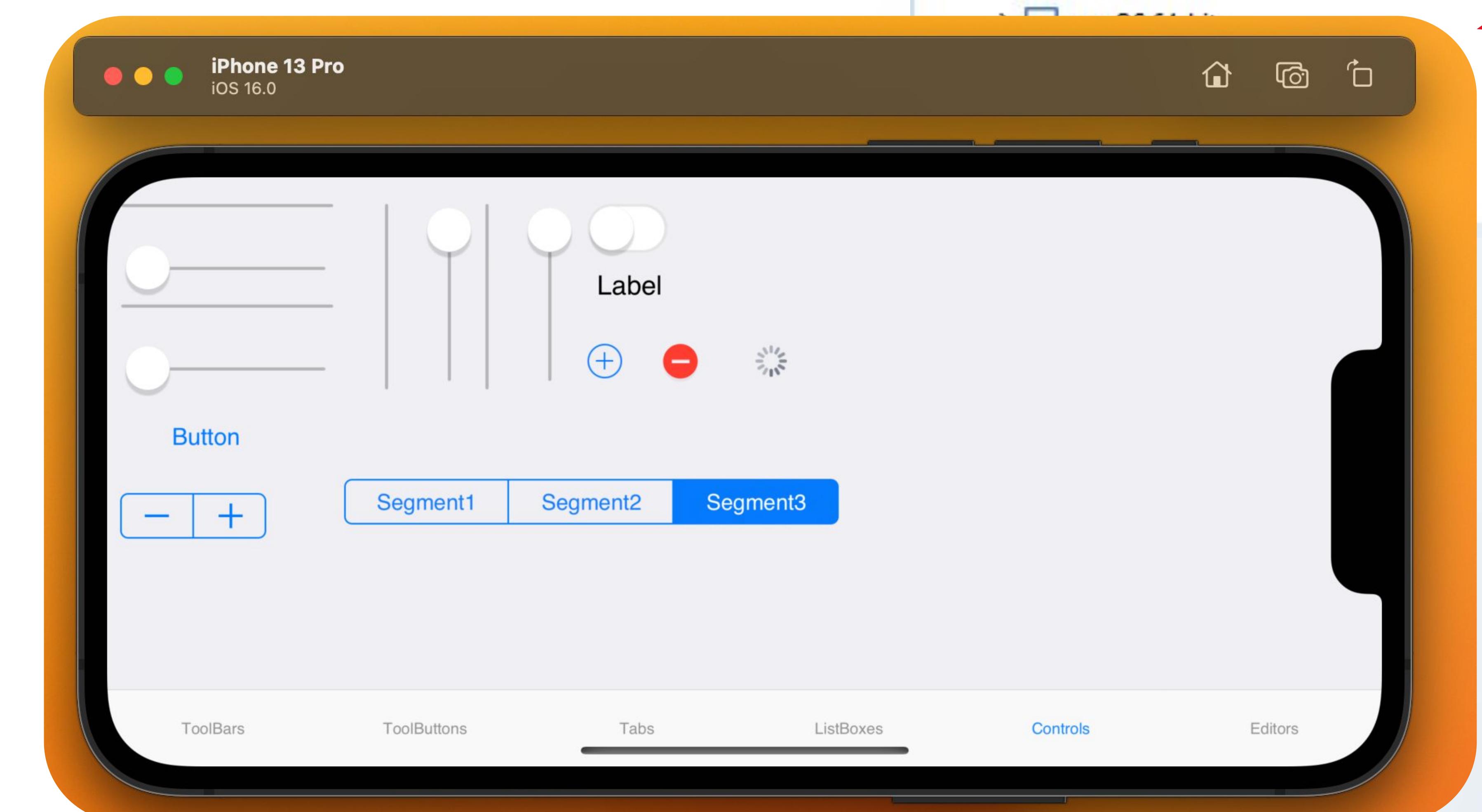
count(*)	ShipCountry
122	USA
122	Germany
83	Brazil
77	France
56	UK
46	Venezuela
40	Austria
37	Sweden

OK Cancel



iOS Simulator Support

- New Target Platform for Delphi in 11.2
- Simulator very useful for fast iteration:
 - Deploy to the simulator, and debug, is much faster than to the actual device
- Apple moving to ARM across all devices, including running iOS apps on Mac
- In 11.2, run Delphi iOS apps through the simulator on M-series CPU Apple devices



11.2 Quality Portal and Overall Quality

- Specific fixes for over 450 QP issues (1070+ in 11.x)
 - New Features: 30
 - Bugs: 400+
- QP issues addressed by product area:
 - IDE: over 350 issues
 - FireMonkey and VCL: around 100 issues each
 - RTL, Data, Compilers: over 75 issues for each area



RAD Studio 11.2: iOS Simulator & Quality / Polish

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III. Code Insight / DelphiLSP

- Reworked Help Insight (and using XSLT again)
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- C++ Code Insight from 11.1.5

IV. Platforms and Tooling

- iOS Simulator for Delphi
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- Remote Debugging Win64 C++

V. Libraries

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- General VCL and FMX Quality
- ZLib, HTTP / REST
- RAD Server
- FireDAC reFind, Updated Drivers, and FDMonitor/FDExplorer

Additional Product Initiatives

Appercept's AWS SDK for Delphi

- Long term distribution deal, included in Enterprise and Architect
- Covers many features of the AWS SDK
- New releases and features expected at a constant pace



AWS SDK

SonarDelphi

- Static Code Analysis plugin for SonarQube
- Focused on code security and bug prevention



Python

- *Based on Python4Delphi*
- Delphi UI libraries (VCL + FMX) for Python
- Python Libraries for Delphi Developers



SonarDelphi

- Static Code Analysis plugin for SonarQube
- Based on existing open source libraries
- Embarcadero's official collaboration with previous maintainers
- Focused on code security and bug prevention
- More features and improvements planned
- Currently includes 49 rules
- Integrates with Code Coverage and Unit Testing
- github.com/Embarcadero/SonarDelphi



Joachim Marder
JAM Software



Laurens van Run
MendriX



SonarDelphi Webinar



Static Code Analysis

Improving Code Quality Before You Compile

- December 8th, 2022 at 4 PM BRT / 7 PM UTC



Joachim Marder
JAM Software



Laurens van Run
MendriX



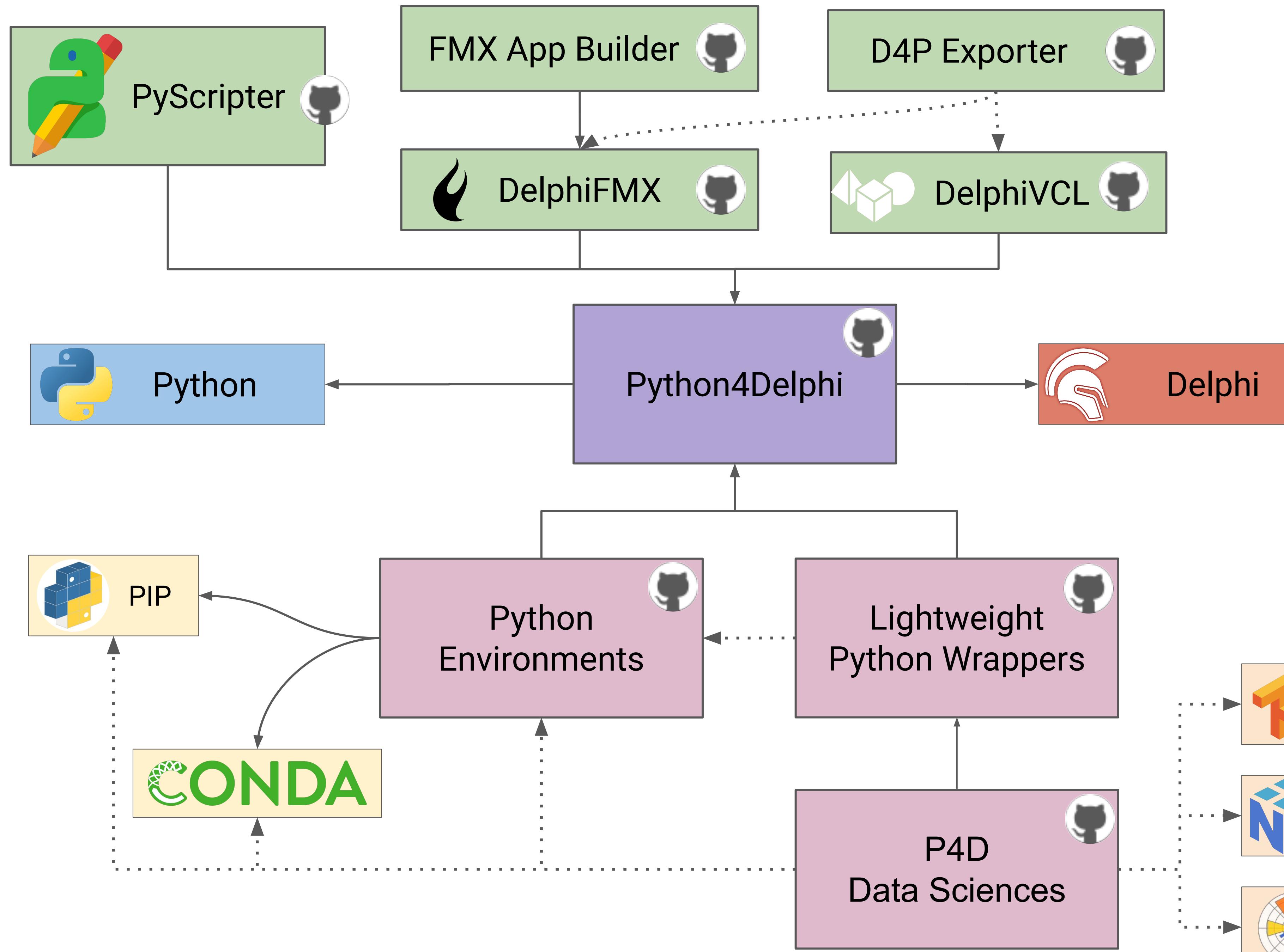
Embarcadero
Python
Ecosystem





Embarcadero Python Ecosystem

For *Python*
Developers



For *Delphi*
Developers

- PythonGUI.org
- GitHub
- GetIt
- PyPi
- Conda Forge



Python4Delphi:

The *Bidirectional* Bridge

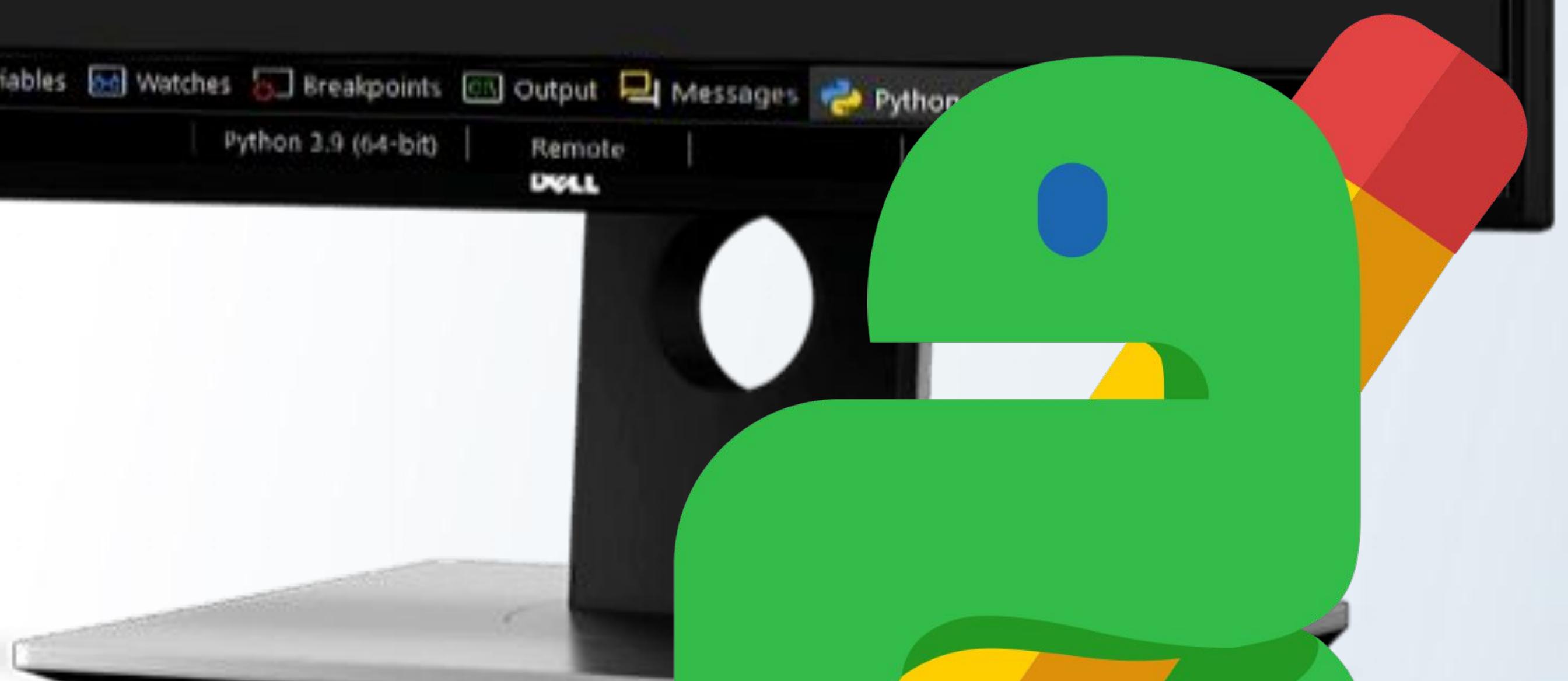
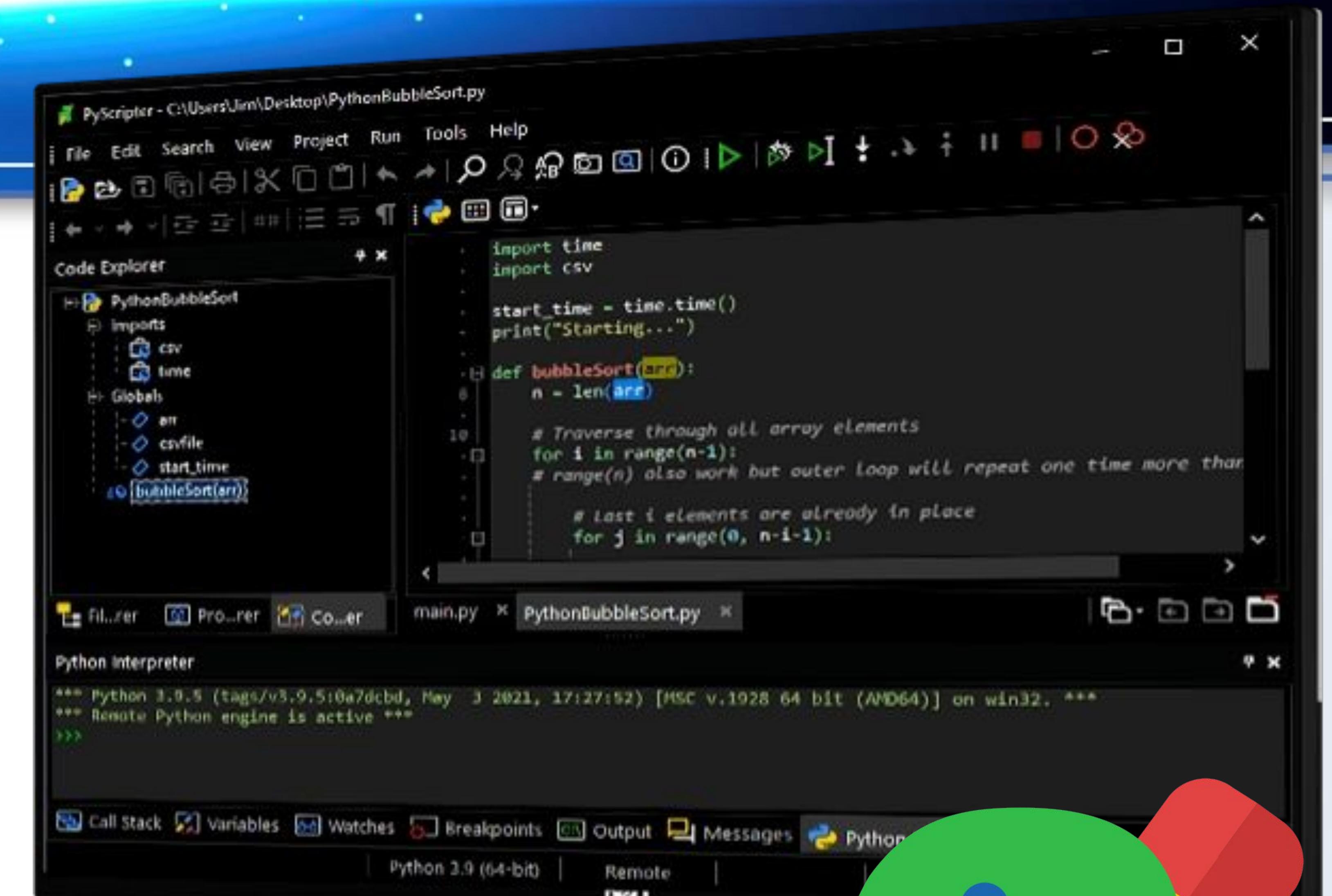


Open source library written in Delphi
github.com/Embarcadero/Python4Delphi
Original maintained by Kiriakos Vlahos (aka PyScripter)

PyScripter

Open source, full featured, and lightweight Python editor for Windows, written in Delphi.

- Full Python debugging with support for remote debugging
- Integration with Python tools like PyLint, TabNanny, Profile etc.
- Full support for encoded Python source
- Run or debug files from memory
- Choice of Python version to run via command line parameters
- Run Python Script externally (highly configurable)
- Modern GUI with docked forms
- Persistent configurable IDE options



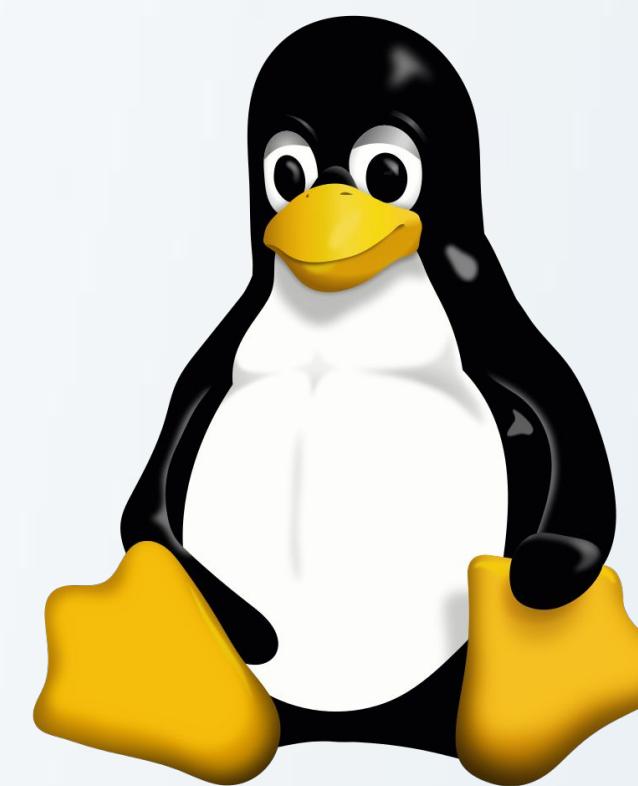
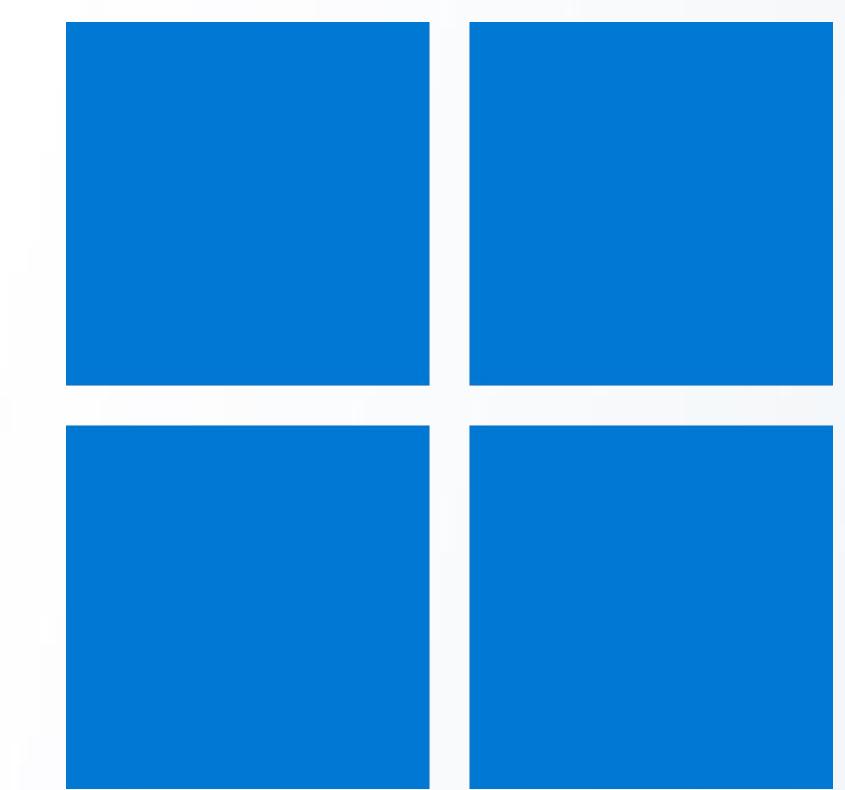
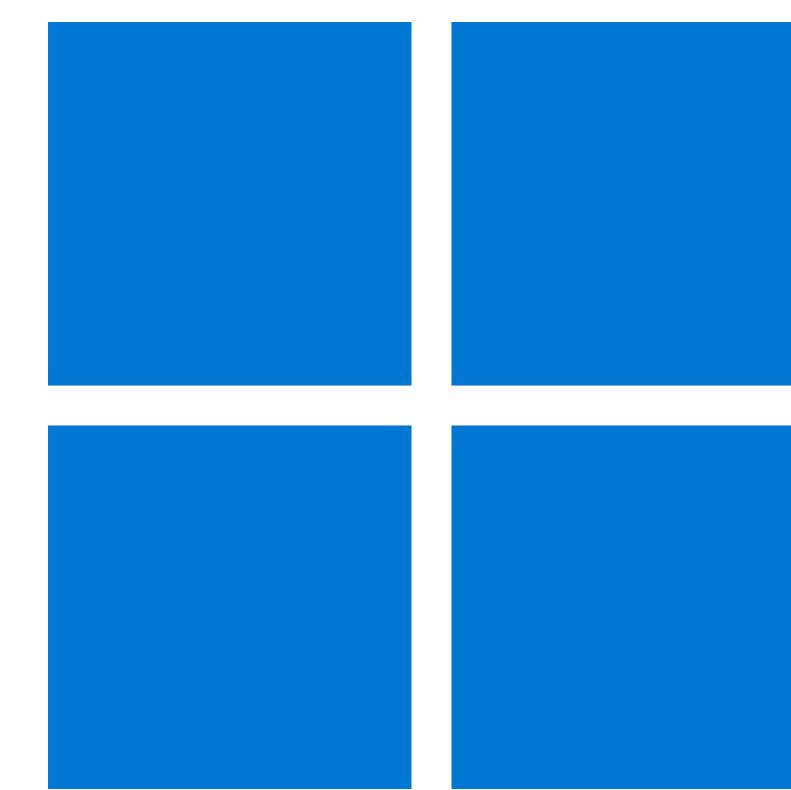


Delphi for Python



Delphi VCL for Python

- Windows 32-bit and 64-bit only
- Windows 8.1 through Windows 11
 - Earlier versions may work but are not supported
- Based on native Windows components
- Includes Windows Handles, Messages, Accessibility, etc.
- Styling system



Delphi FMX for Python

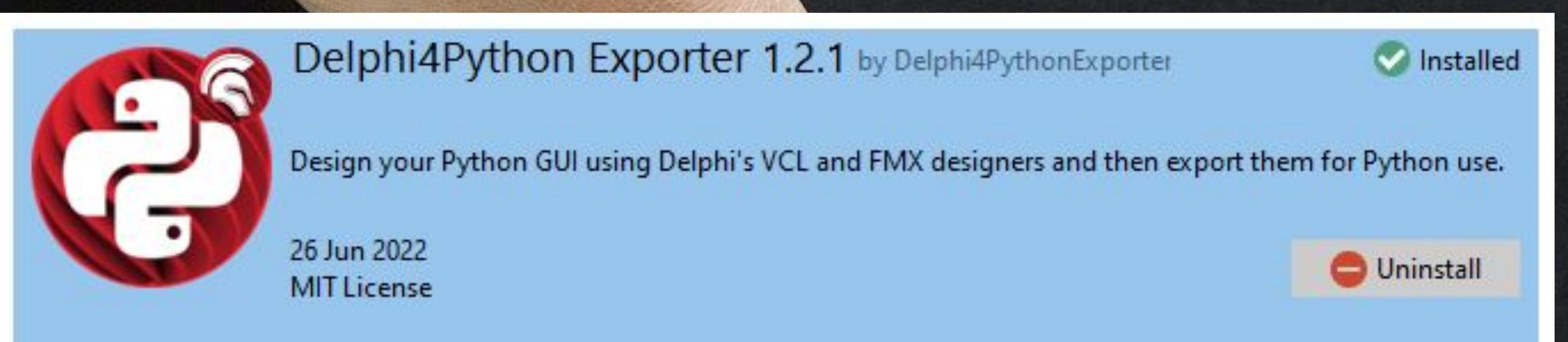
- Uses GPU for custom rendering
- Multi-platform for Windows, Linux, Android, and Mac OS
- Higher level of abstraction
- Platform services simplify behaviors
- Styling system





Design Your UI in the Delphi IDE

- Take full advantage of the Delphi IDE designers and property editors
- WYSIWYG preview with styles
- Export the form for use in Python
- Requires no Object Pascal knowledge
- Still write all your code in Python
- Just right-click and export with the D4P Exporter IDE add-in
- Available via **GetIt** and GitHub
github.com/Embarcadero/Delphi4PythonExporter



FMX App Builder

Simplifies bundling app to run Python on Android

Features

- A pre-built Delphi application with Python enabled
- User modifiable Python script payload that runs automatically
- Automated tool to modify the Android Manifest and bundle APK
- *Full Debugging of Python scripts on Android*

To Do

- Live preview before deploying to Android
- Bundling multiple Python scripts & modules
- Customize icons, splash screens, loading, etc.
- Integrate into PyScripter & Cross Platform IDE
- More testing, debugging, and your suggestions....



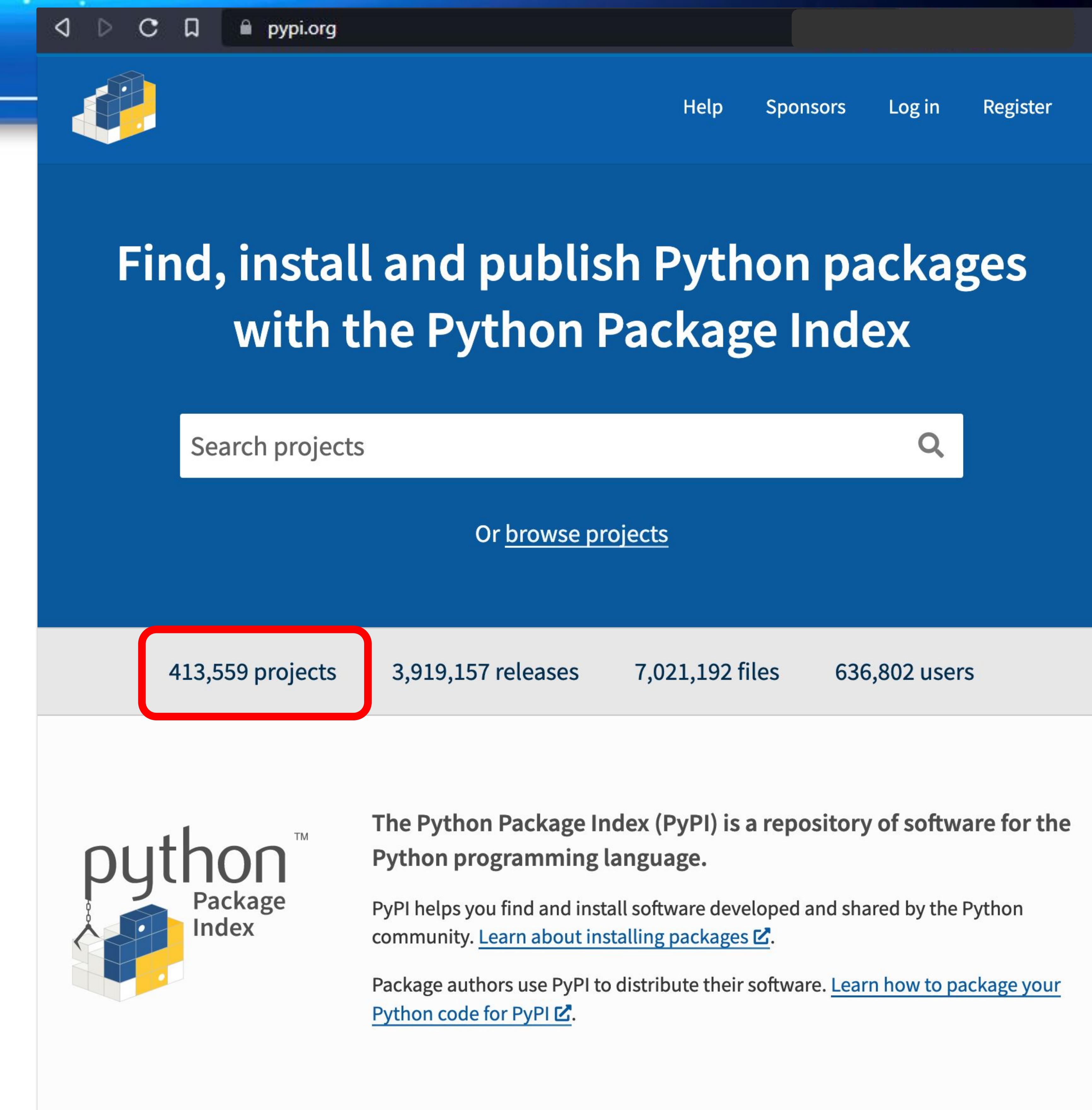
Python for Delphi Developers

RAD

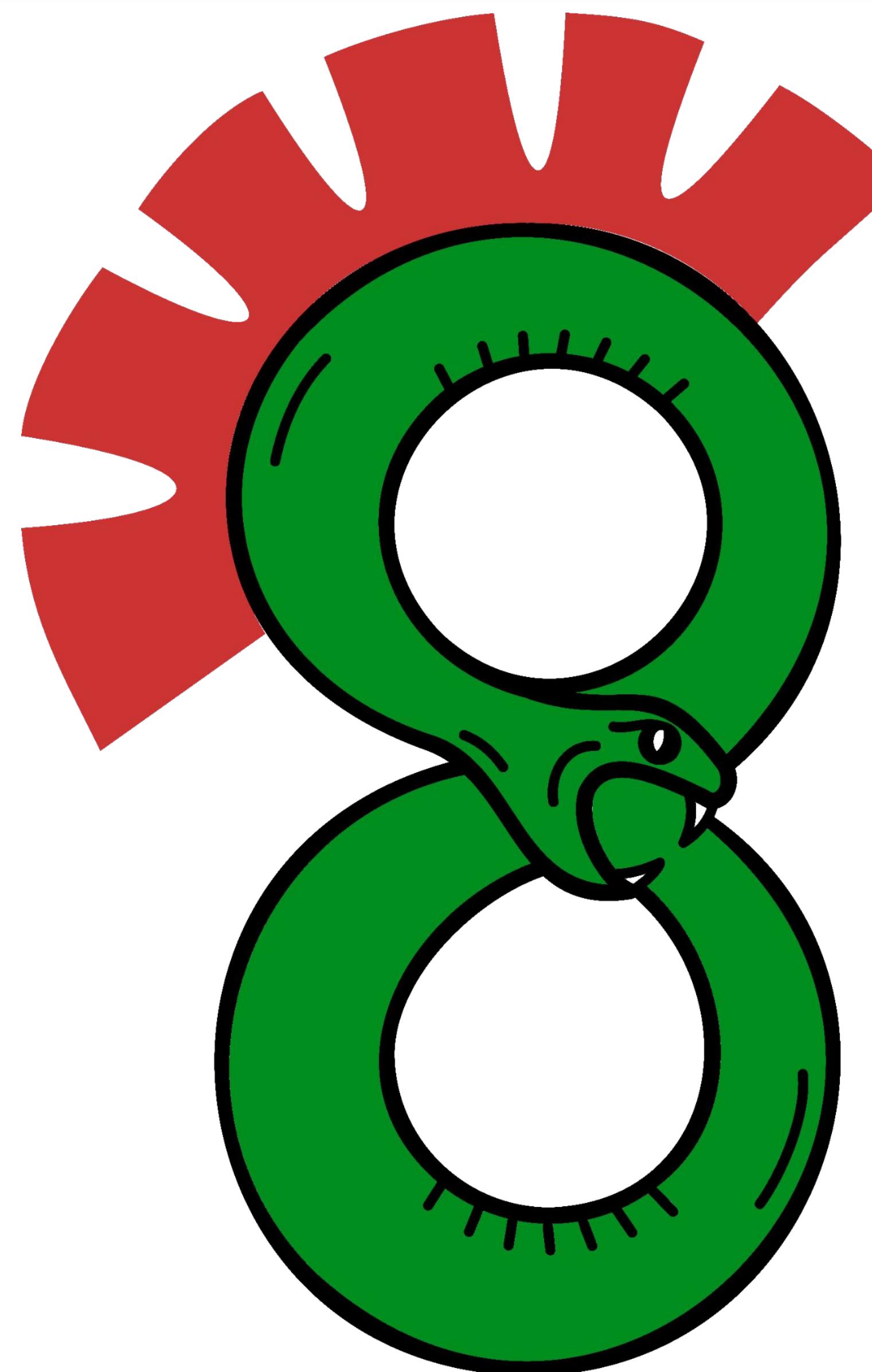
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We Need More Components!

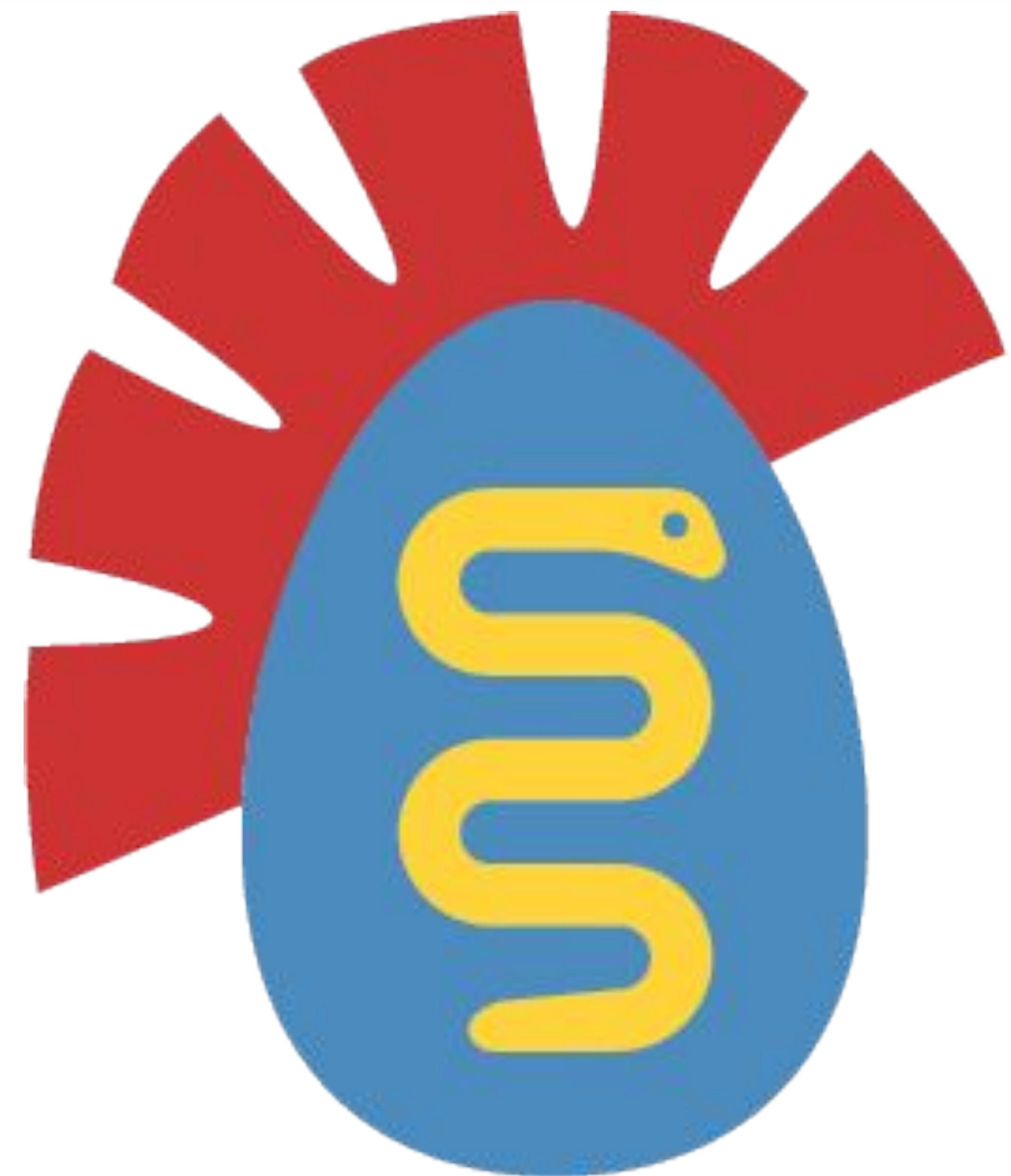
- Reusable components and libraries make us more productive
- Delphi and C++Builder has a huge rich ecosystem of Tech Partners and open source
- But wouldn't be great to have ***EVEN MORE?***
- Python has one of the richest ecosystems, especially for data sciences, AI, & ML
- What if Delphi & C++Builder could easily ***USE THEM ALL?***



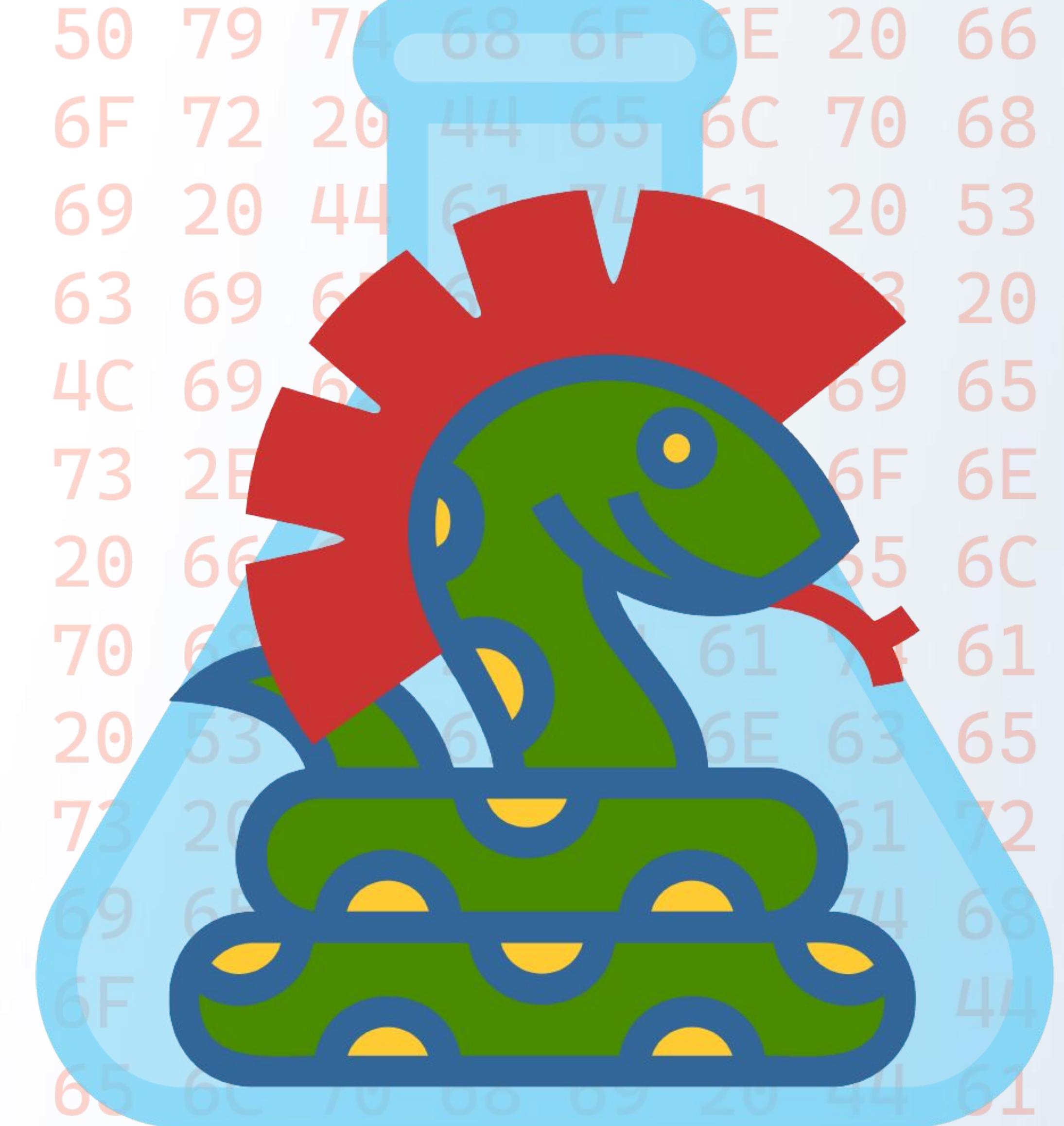
Three All New Projects



Lightweight Python
Wrappers



Python
Environments



P4D Data Sciences
Libraries

All powered by *Python4Delphi*



For Delphi
Developers



P4D Data Sciences

- Based on the Lightweight Python Wrappers, Python Environments, and Python4Delphi
 - Delphi components for popular Python Data Sciences tools
 - Currently includes:
 - Tensorflow, NumPy, PyTorch Vision, PyTorch, Matplotlib, Natural Language Toolkit (NLTK), OpenCV, and Scikit-learn
 - Includes samples
 - Surprisingly easy to make and use
 - Literally a couple hours work to add and test a new library
 - *Looking at additional libraries to add....*

github.com/Embarcadero/P4D-Data-Sciences





Demo

- Simple code found on nltk.org
- Showing off basic functionality
- Python code running in the REPL, with results displayed inline

Tokenize and tag some text:

```
>>> import nltk  
>>> nltk.download('popular')  
>>> sentence = """At eight o'clock on Thursday morning  
... Arthur didn't feel very good."""  
>>> tokens = nltk.word_tokenize(sentence)  
>>> tokens  
['At', 'eight', "o'clock", 'on', 'Thursday', 'morning',  
'Arthur', 'did', "n't", 'feel', 'very', 'good', '.']  
>>> tagged = nltk.pos_tag(tokens)  
>>> tagged[0:6]  
[('At', 'IN'), ('eight', 'CD'), ("o'clock", 'JJ'), ('on', 'IN'),  
('Thursday', 'NNP'), ('morning', 'NN')]
```

Downloads the required data. Only necessary once.

Identify named entities:

```
>>> entities = nltk.chunk.ne_chunk(tagged)  
>>> entities  
Tree('S', [(['At', 'IN'), ('eight', 'CD'), ("o'clock", 'JJ'),  
          ('on', 'IN'), ('Thursday', 'NNP'), ('morning', 'NN'),  
          Tree('PERSON', [(['Arthur', 'NNP'])]),  
          ('did', 'VBD'), ("n't", 'RB'), ('feel', 'VB'),  
          ('very', 'RB'), ('good', 'JJ'), ('.', '.')])
```



Demo

- There are a series of event handlers notifying your program of state of the Python Environment.
- Here is the Delphi version of the Python code.
- The output of each step is displayed in the list boxes.
- When compiled there is a single EXE.
- At runtime the Environment sets up a nested Python environment with all the necessary dependencies.

```
with NLTK1 do begin
    nltk.download('popular');

    var tokens :=
        nltk.word_tokenize(memo1.lines.Text);
    VarPyToStrings(tokens, ListBox1.Items);

    var tagged :=
        nltk.pos_tag(tokens);
    VarPyToStrings(tagged, ListBox2.Items);

    var entities :=
        nltk.chunk.ne_chunk(tagged);
    VarPyToStrings(entities, ListBox3.Items);
end;
```

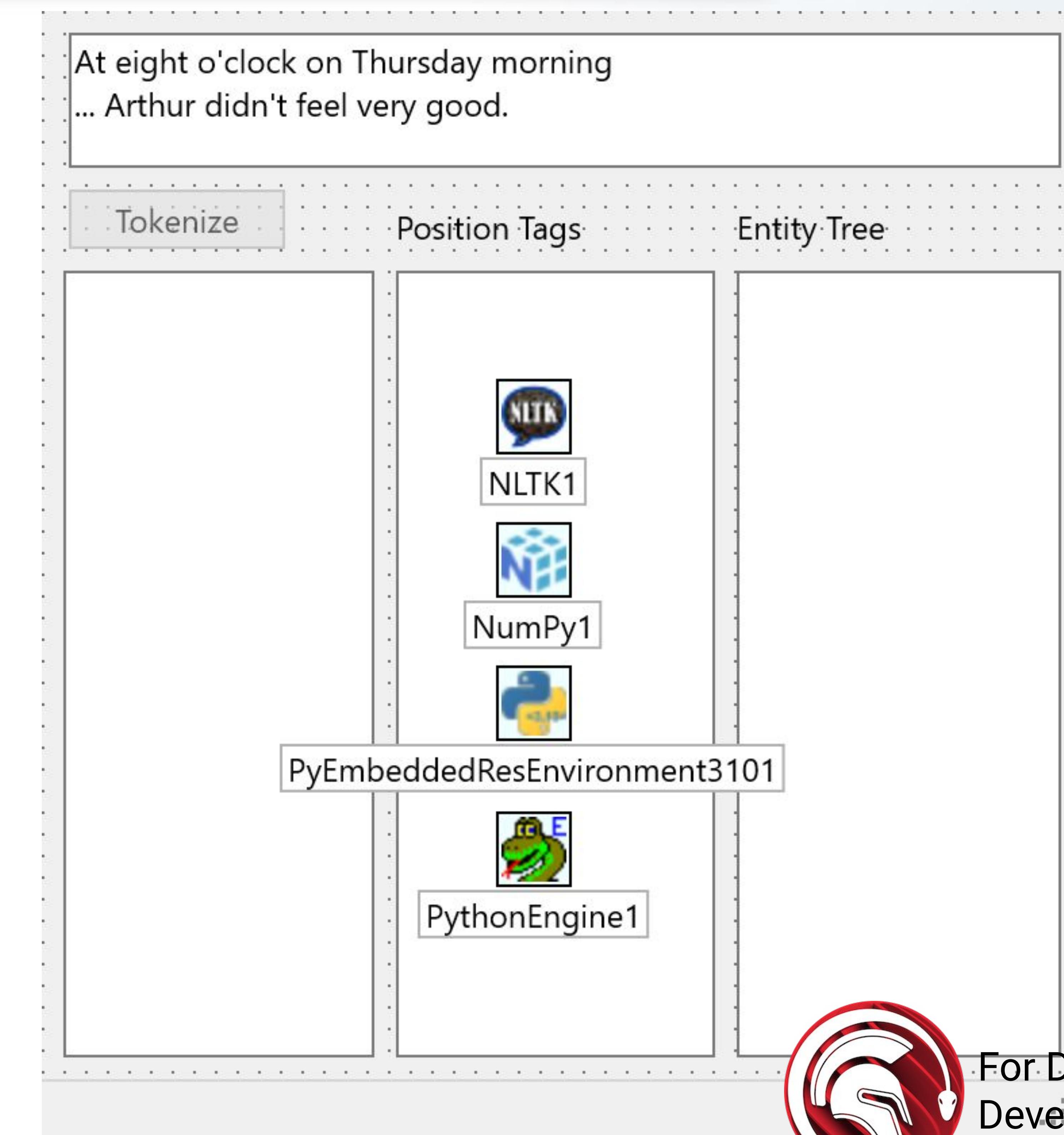


For Delphi
Developers



Demo

- Add the following components:
 - TPythonEngine
 - TPyEmbeddedResEnvironment310
 - TNumPy
 - TNLTK
- Connect the components
- Make the UI
- Leave the Tokenize button disabled, then use an event handler from the Environment to enable it when everything is setup.



For Delphi
Developers

Python4Delphi

Demonstration

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Learn more about Python4Delphi

16h30 in IA, IoT, Inovação

Apresentando Python para Delphi

Lucas Moura

Lucas Moura irá apresentar alguns dos projetos de integração do Python com Delphi, exibirá os componentes e o projeto como um todo.

github.com/Embarcadero/P4D-Data-Sciences



What's Cooking?

Coming in the next Delphi...

RAD

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RAD Studio: What are we Working On?

RAD Studio 11.3 Alexandria Release**

Continue with ***quality improvements*** for the 11.x product (and some small features)

Quality focus areas include:

- Delphi LSP
- RAD Studio IDE (High DPI and general UX)
- Compilers and toolchains
- VCL library (including VCL styling)
- FMX quality (for all target platforms)
- Product installation
- New ToolsAPI for the code editor

Next Major RAD Studio Release**

Focusing on ***some significant new features*** throughout the product

Main work areas include:

- Updated C++ Win64 compiler (Clang upgrade) including STL
- C++ tooling with Visual Assist technology
- New VCL modernization features
- Skia support in FireMonkey and VCL

****** Features are not committed until completed and GA released

**I HAVE NO
IDEA WHAT SKIA IS**



**AND AT THIS POINT
I'M TOO AFRAID TO ASK...**

Google Skia

- Open Source
- Cross Platform
- High Performance
- 2D Graphics engine



- skia.org
- skia.org/docs
- github.com/google/skia

About Skia4Delphi

- OpenSource
 - Uses a modified fork of Google's Skia
- Cross-Platform & Multi-Framework
- 2D graphics library for Delphi
- Drawing
 - Text
 - Animations
 - Images
- Focus on Quality & Performance



The logo features the word "SKIA" in large, bold, orange letters. Below it, the words "FOR DELPHI" are written in red, with a small red icon of a Spartan helmet replacing the letter "O". A red circular badge with the letters "RAD" is positioned to the left of the text.

www.skia4delphi.org

github.com/skia4delphi/skia4delphi

Skia4Delphi

Demonstration

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What is the Spirit of Delphi Award?



- Introduced in 1998
- Announced as part of the annual developers conference
- Winners are selected by internal Delphi team members
- Candidates are considered based on their contributions to the spirit of Delphi and the community of developers
- Winners fundamentally improve and expand what it means to be a Delphi developer

Past Spirit of Delphi Award Winners

- 1998 Robert M. Czerwinski (The Delphi Super Page) &
Fedor Koshevnikov, Serge Korolev & Igor Pavluk (RX Library)
- 1999 Marco Cantù & Bob Swart (Authors & Trainers)
- 2000 Maxim Peresada (Torry's Delphi Pages)
- 2001 Project JEDI (*all contributors*)
- 2002 Mark Miller (Author of CodeRush & speaker)
- 2003 Ray Konopka (Raize Software)
- 2004 Nick Hodges (The Chuck Norris of Delphi)
- 2005 Pierre le Riche (FastMM4)
- 2006 The entire Delphi community
- 2007 Andreas Hausladen (IDE Fix Pack)
- 2018 Cary Jensen (Author & Trainer)
- 2019 David Intersimone (The original developer advocate)
- 2020 Dave Nottage (DelphiWorlds.com)



2021 Spirit of Delphi Award Winners

- Two brother from Brazil
- Working tirelessly on an open source project
- Vinícius Felipe Botelho Barbosa
- Paulo César Botelho Barbosa
- skia4delphi.org



SKIA
FOR DELPHI



e
mbarcadero®

Find out more about Skia4Delphi

16h30 in UI, UX, Mobile, Desktop

Desenhe com máxima performance
usando a GPU e shaders com o Skia4Delphi

Paulo César Botelho Barbosa

SKIA
FOR DELPHI



Beyond Delphi...

RAD

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Committed to Best-in-class Tools and Brands

Data Tools



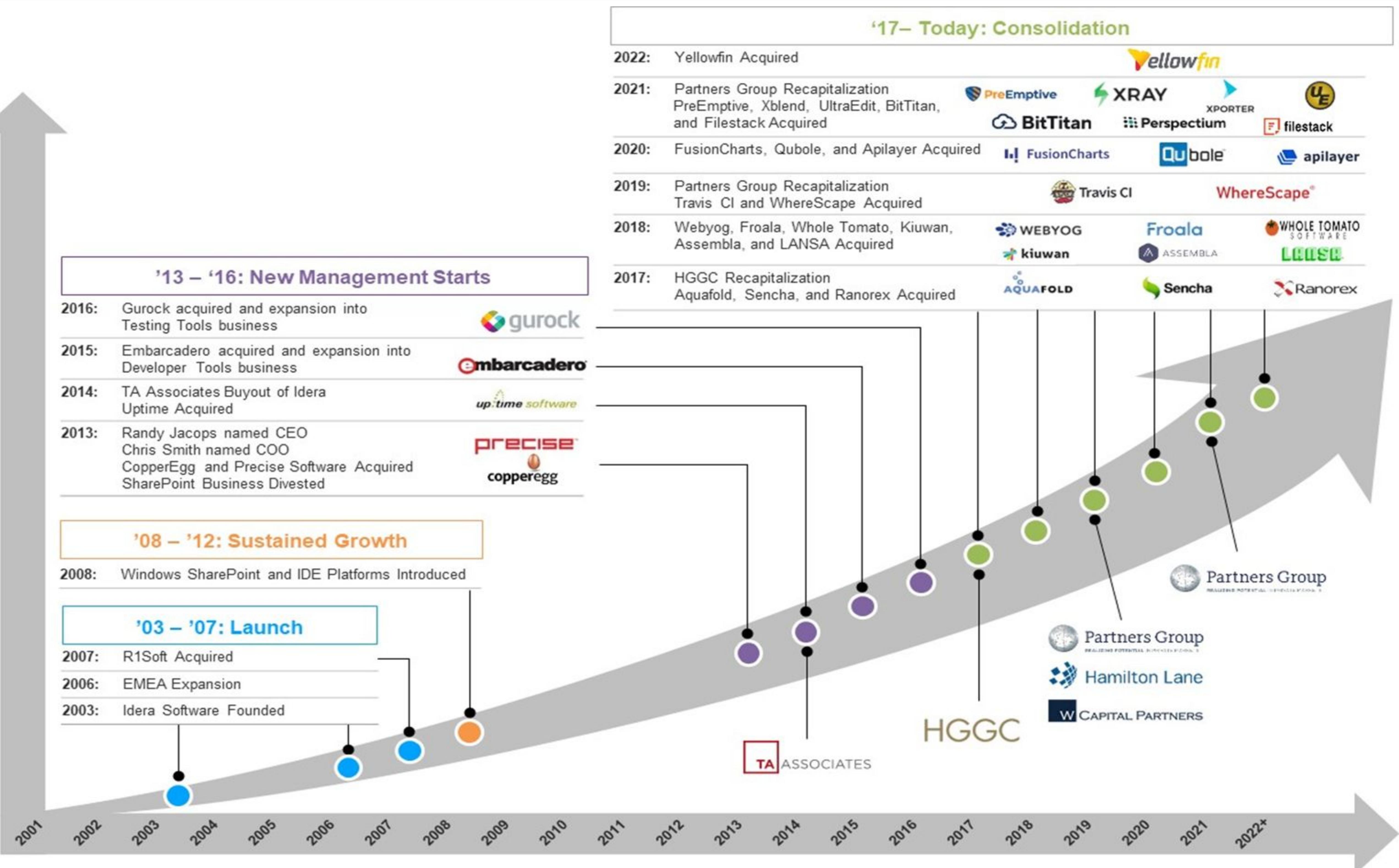
Developer Tools



DevOps



Idera, Inc.



- Growth + Profitability
- Based in Austin, TX
- 1,000+ global team
- Large partner network
- Scaled operating model
- Strong capital backing

Idera, Inc. Developer Tools

Focus on Developers!

- Develop and acquire **best-in-class development tools**
- **Open technology approach** that puts developer choices first (i.e. no alignment with one set of technology or toolchain)
- **Global reach with local approach** extended through partners



Great Products: Core to Our Success



FusionCharts

“

FusionCharts was a pioneer in delivering a complete cross-framework charting toolset.

– Leading ISV



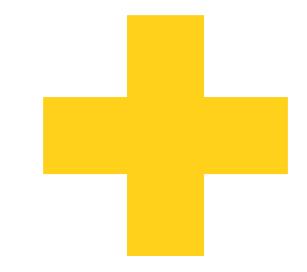
Yellowfin is an AWESOME fit!

“Yellowfin’s single platform includes one of the broadest ranges of capabilities, spanning data preparation, reporting with scheduled distributions, visual exploration and augmented analytics” –

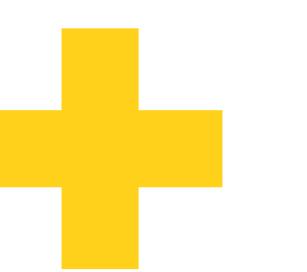
Gartner



Best-in-Class



Easy to Use

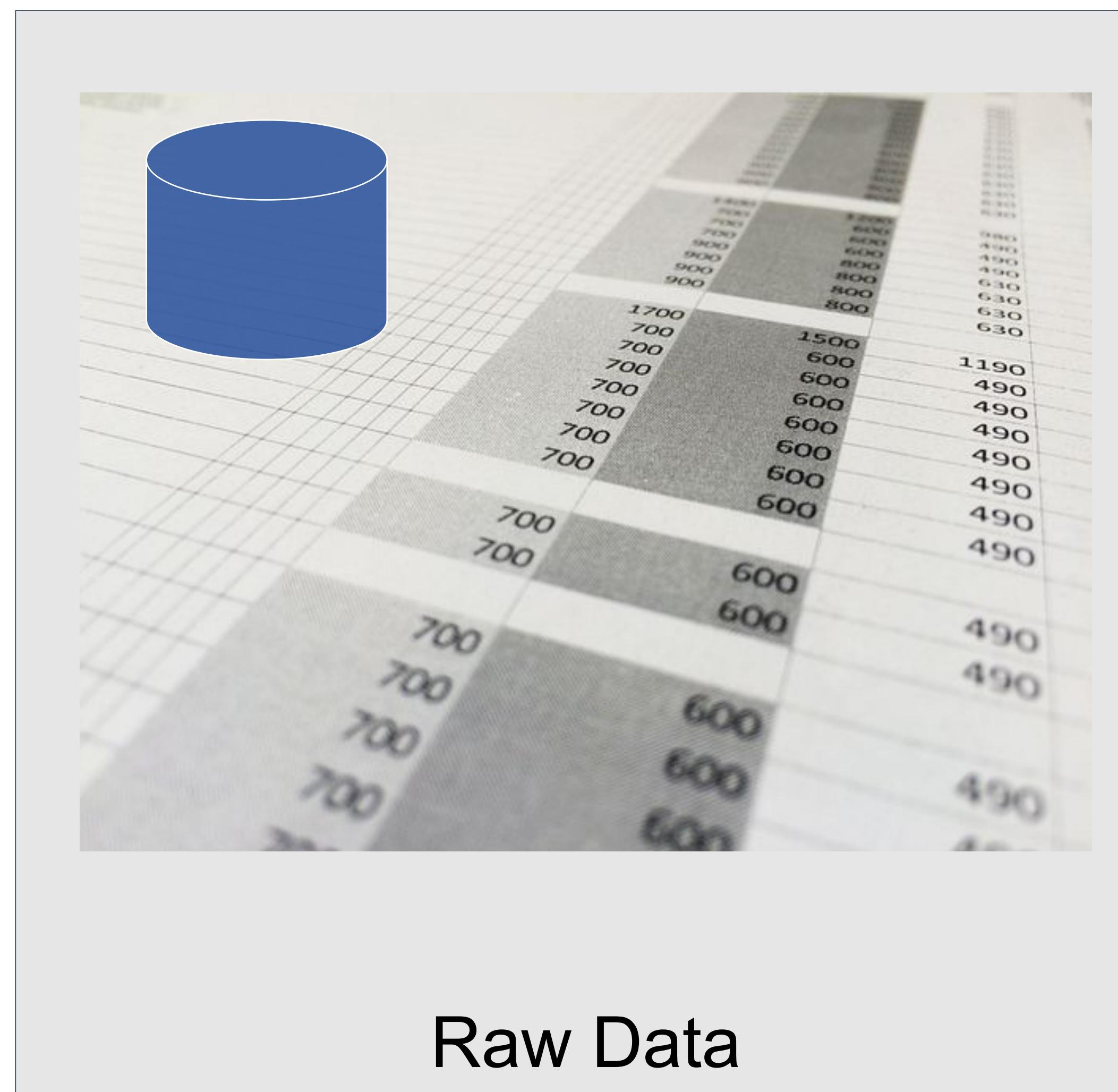


High Growth

What is BI?

Business Intelligence, is the process of creating actionable insights from raw data to support the decision making processes.

Why? Transform your business or software through data



+

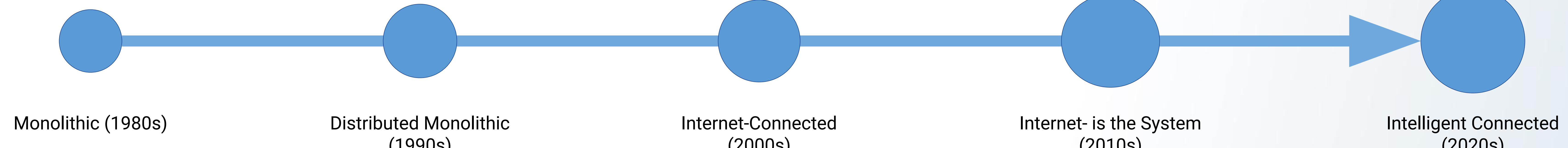


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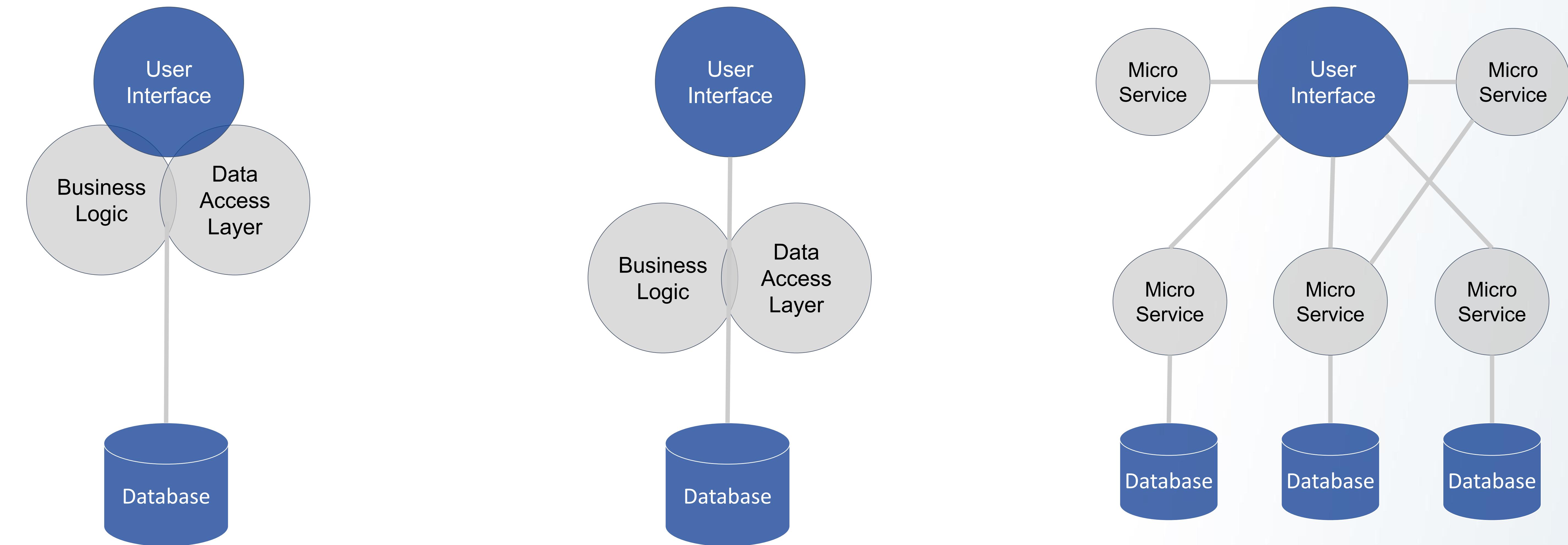


System Evolution

System Evolutions



Architecture Innovations

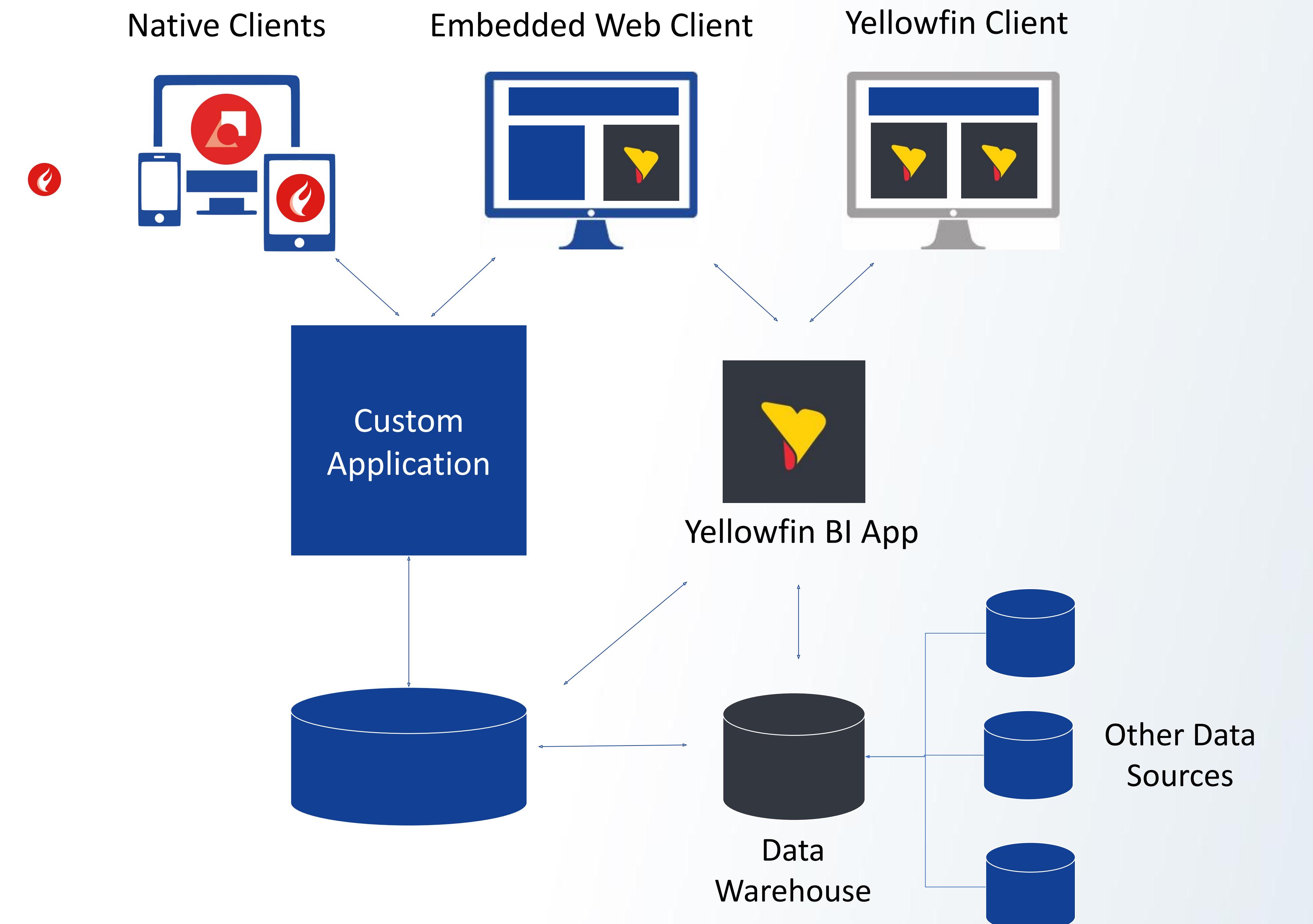


Intelligent Connected B.I.

Choice of User Interface
Local, Remote, Dashboards etc

Business Logic & Data Access Layer
Rapidly expand your system with fully
featured BI intelligence

Data Layer
Use existing data layers, and also draw in
non-structured data with data automation that you
can report on inside your existing applications



Demo



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Benefits of B.I. Integration

Make your users more efficient and improve the value of your product

Advanced BI capabilities provide better information and insights to your user base, enabling them to be more efficient and make better decisions. Further, integrating BI directly into your application workflows (known as contextual embedding) provides users the right information at the exact point a user needs it.

Simplify the architecture for clients

Combining BI capabilities removes the need for customers to create their own solutions, for example using data extracts to build Excel spreadsheets, or feeding your data into another BI tool.

Create greater product stickiness

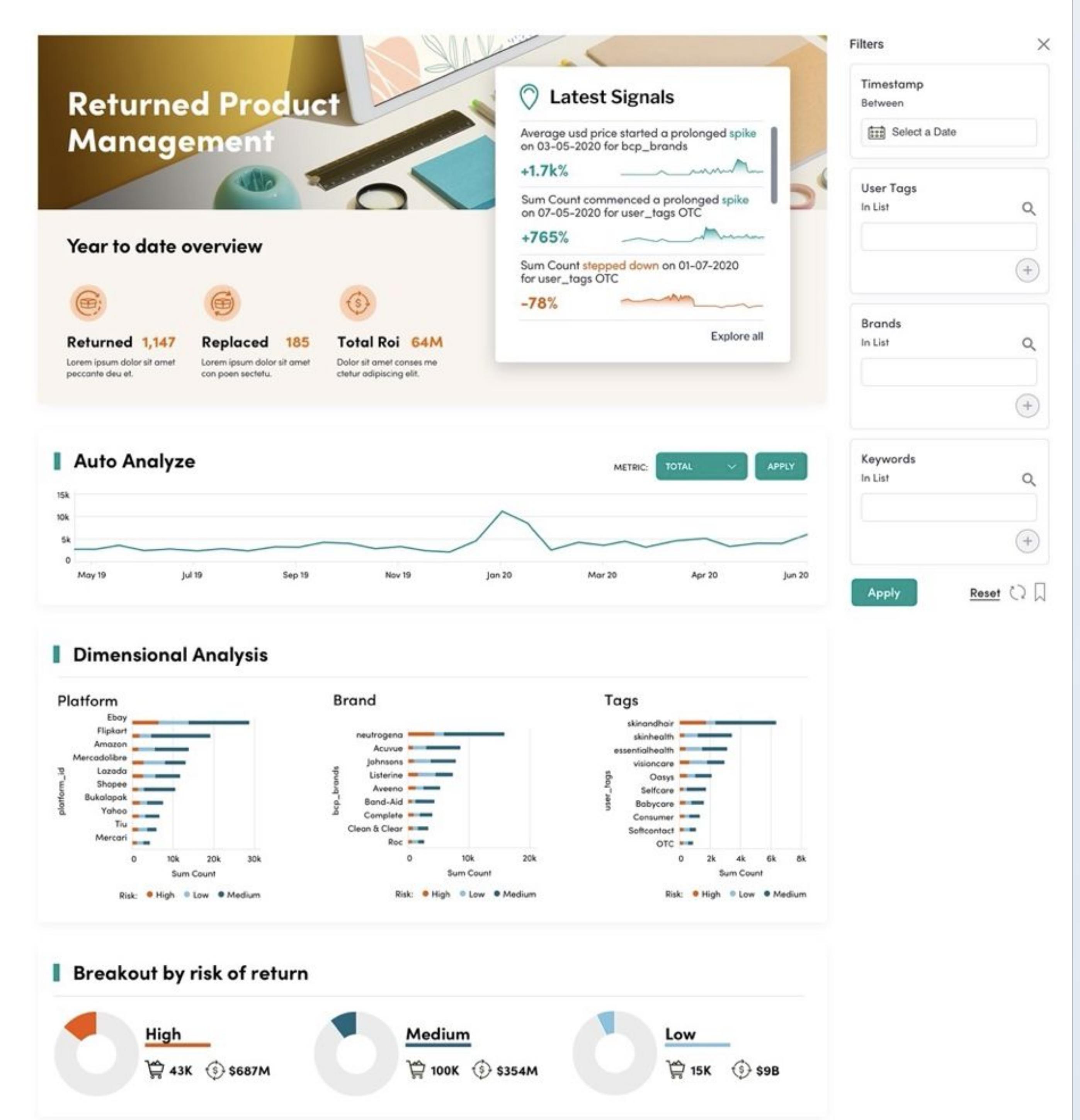
Improved value add reduces the likelihood of churn. Customers who make use of self-service capabilities of the platform by building their own content are less likely to move to another platform at the risk of throwing away their investment in your product.

Reach new user personas

Aggregated data visible through reports and dashboards can broaden the user base of the platform to include more management and executive personas.

Get to ROI Faster!

Create applications or application modules fast and package in a way that increases your revenue (value) potential





InterBase

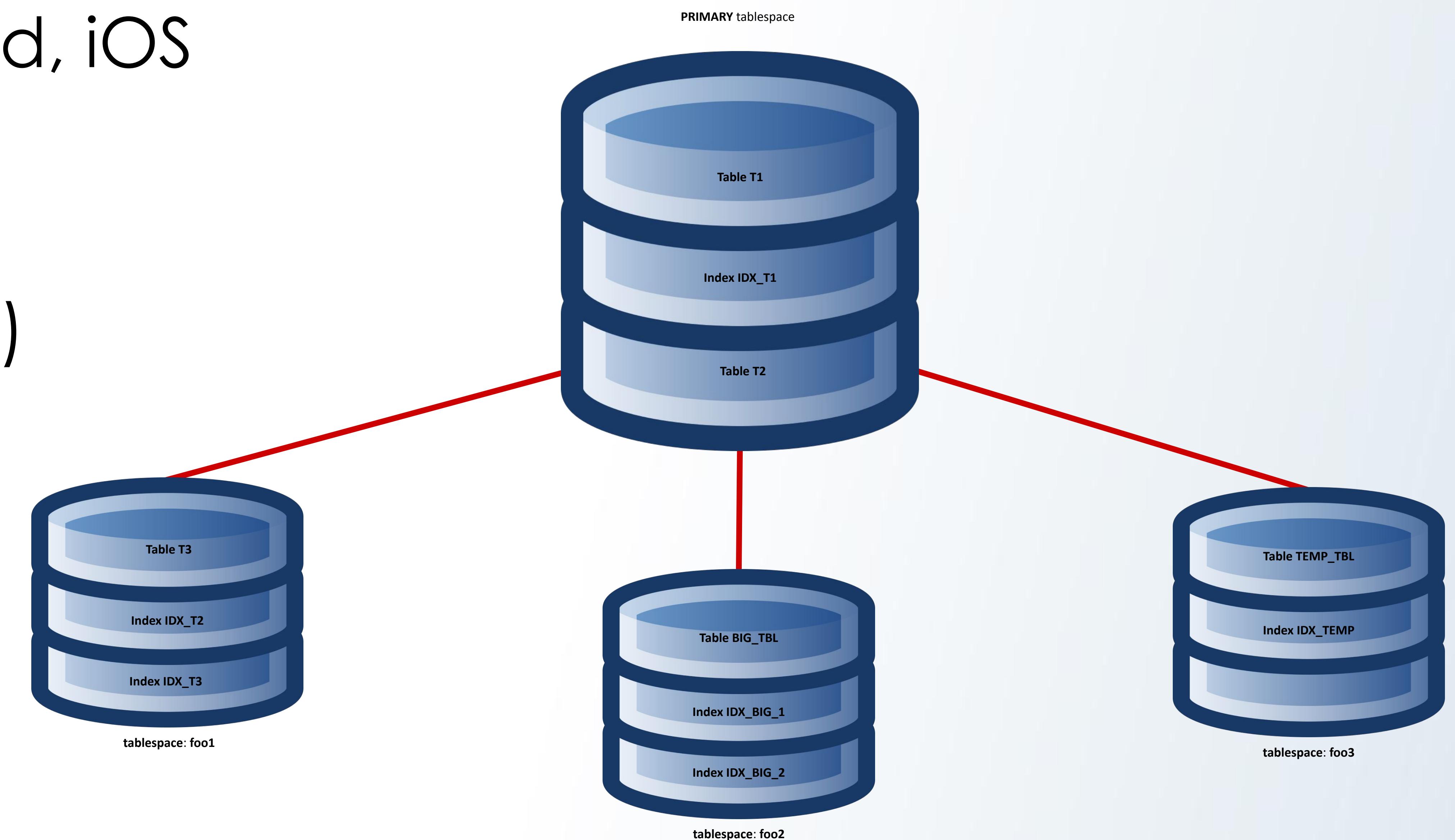
IOTA

INTERNET OF THINGS AWARDS
WINNER

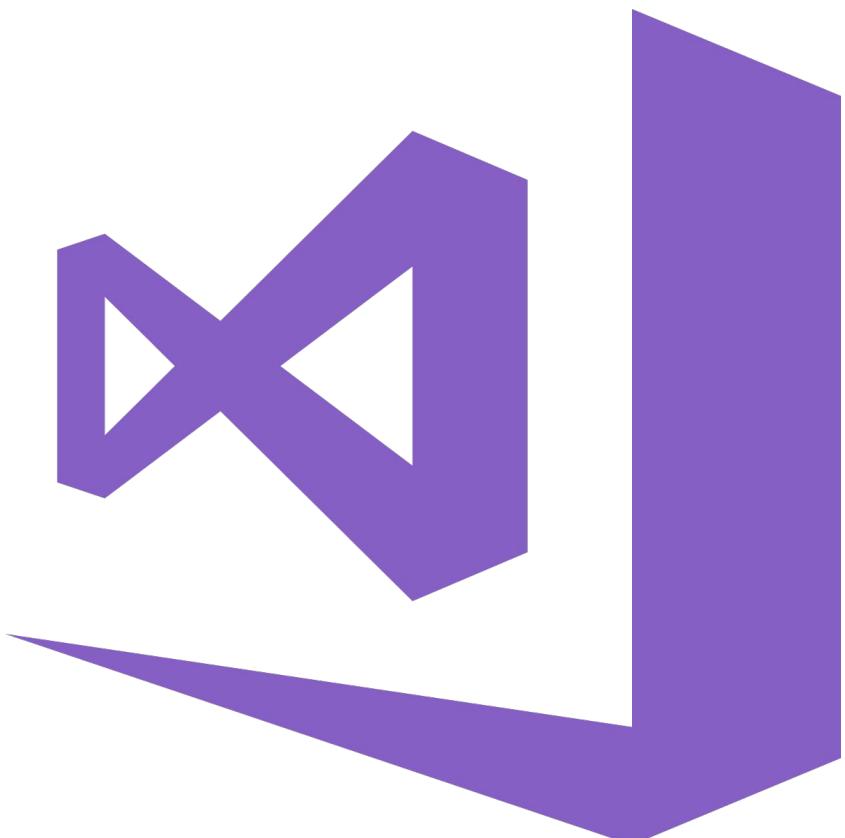
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Interbase Main Features

- Truly Multiplatform
 - Windows, Mac, Linux, Android, iOS
- Integrations/Connectivity
 - Native for RAD Studio
 - ODBC, JDBC, ADO.NET (new)
- Self Tuning & Performance
- Security/Encryption
- Disaster Recovery
- Change Views
- Tablespaces!



InterBase Editions



GitHub : <https://github.com/Embarcadero/IB.NETDataProvider>

NuGet Drivers : <https://www.nuget.org/packages/InterBaseSql.Data.InterBaseClient/>

Entity Framework : <https://www.nuget.org/packages/InterBaseSql.EntityFrameworkCore.InterBase/>



Q & A



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