The modern OpenEdge developers toolstack

Mike Fechner, Consultingwerk

Mike Fechner

- Director, Lead Modernization Architect and Product Manager, Architect of the SmartComponent Library and WinKit

- Specialized on object-oriented design, software architecture, desktop user interfaces and web technologies

- 34 years of Progress experience (V5 … OE12)

- Active member of the OpenEdge community

- Frequent speaker at OpenEdge related conferences around the world

The full stack modernization framework
SmartComponent Library

Consultingwerk Software Services Ltd.

- Independent IT consulting organization

- Focusing on **OpenEdge** and **related technology**

- Located in Cologne, Germany, subsidiaries in UK, USA and Romania

- Customers in Europe, North America, Australia and South Africa

- Vendor of developer tools and consulting services

- Specialized in GUI for .NET, Angular, OO, Software Architecture, Application Integration

- Experts in OpenEdge Application Modernization

The full stack modernization framework

SmartComponent Library
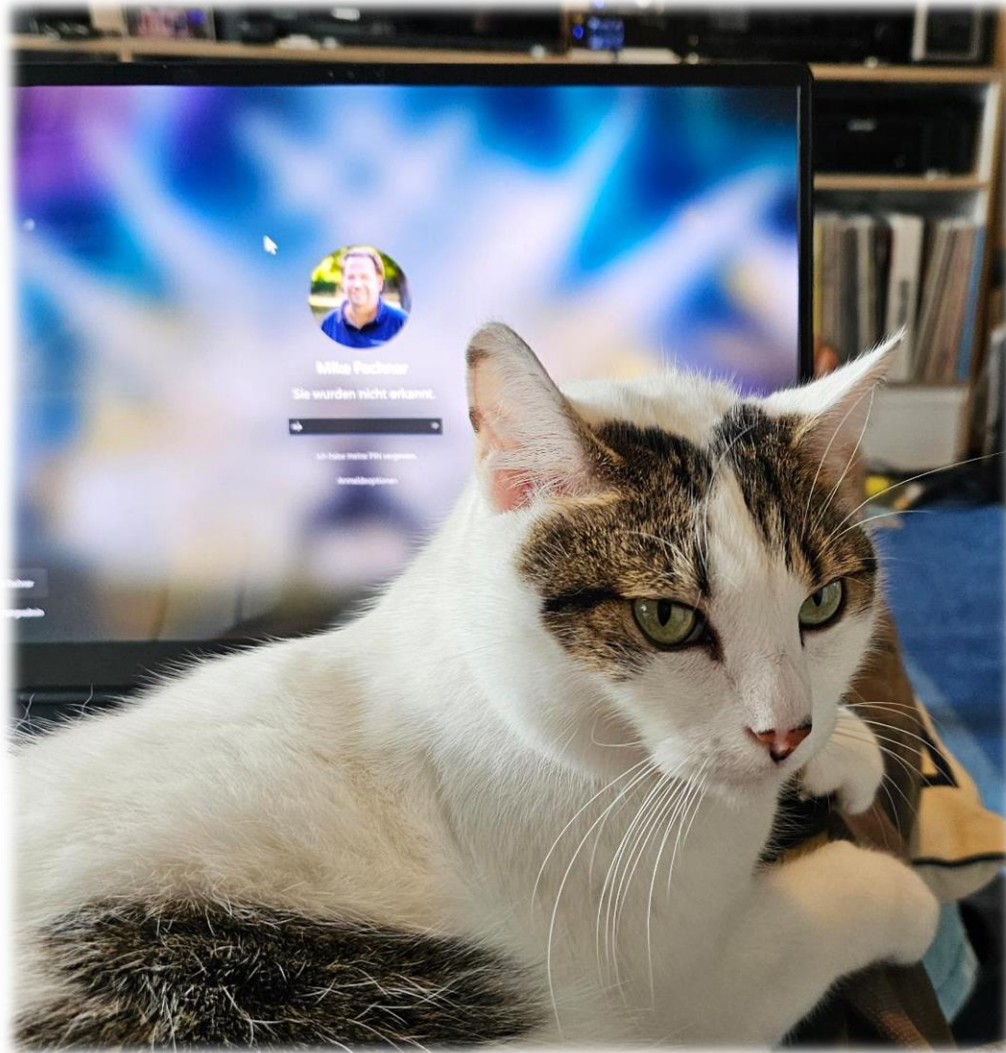
Purpose of developer tools

- Increase productivity
- Allow to focus on problem solving
- Simplify routine tasks
- Support quality
- Integrate with each other
- Provide a comfort zone for developers

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An too often underrated developer tool!

A powerful Laptop/Desktop is a developer tool too

- Today's developer machines:
- 8 GB RAM absolute minimum, better 32 GB or more (RAM typically best value for money), 64 GB is not too extreme
- Modern CPU, high clock speed, lots of cache
- 2 SSD's
- 2 or more 27 inch or larger screens

Jenkins

VS Code

Git

PDSOE

SCM

Ant

SonarQube

Sigrid

ABLUnit

Reasons for not using modern developer tools

- Lack of knowledge of availability of those tools

- "None of that works with OpenEdge anyway"

- Our code base is so special that only UltraEdit (replace with your favorite editor) can handle this

- Our legacy code base won't benefit from Unit Tests anyway

- We won't use cloud-based tools in our organization because of XYZ

- If I'd be introducing those tools, I'd be the one who must support the colleagues

Reasons for not using modern developer tools

- Missing DevOp in the team
- No time to learn about those tools
- Lack of Infrastructure
- Cost of tools

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SmartComponent Library

Legacy Editors

- Progress Developer Studio (OpenEdge Architect) was released in 10.1A – nearly 20 years ago

- Still surprised how often we find developers at new customers using

  - Progress Procedure Editor, AppBuilder

  - UltraEdit

  - Notepad++

  - vi, vim, Emacs for writing ABL code

  - …

- Nothing wrong with those (may be a developer's comfort zone), but modern editors provide sooo much more

Progress Developer Studio

Progress Developer Studio

- Based on Eclipse, IBM's Java IDE

- Workspace and Project-based IDE – a workspace and a project are required to edit files

- Tools to edit ABL source code, AppBuilder GUI and GUI for .NET

- Tools to maintain DB, classic OpenEdge tools like Dictionary, Data Admin, Procedure Editor integrated

- Editor with Code-Completion

- Standalone features: Maintaining of REST Adapter resources, GUI for .NET Visual Designer

Progress Developer Studio

- PDSOE release tied to OpenEdge release and Java version

- Not possible to use 12.8 PDSOE when still on an earlier version of OpenEdge (e.g. 11.7 or 12.2)

- OpenEdge Tooling (scanning ABL source code to support code-completion and other features) problematic in 12.6 – 12.8 (slow and CPU intensive), 12.2 _may_ be a better choice for large code bases, especially large OOABL code bases

Progress Developer Studio

- Windows only
- Support for GUI and TTY code bases

Eclipse Plugins

- Progress Developer Studio benefits from the many plugins available for Eclipse, commercial and open-source

- SCM Integration, code checking, log files, JSON Editor, …

- Plugins downloaded from dedicated update sites, Eclipse market place or (Windows installers)

- Plugins may have dependency on new Eclipse releases or Java versions

- Installing an up-to-date Git client in PDSOE 11.7 can be challenging

- GenAI plugins typically only work with PDSOE 12.8 due to expectation of recent Eclipse release

OEDT – Commercial Extension for PDSOE

- Swiss army knife that fixes many weaknesses of PDSOE

- Better – and faster - code-completion

- Intelligent builder, basic refactoring

- **Omecra going out of business end of January 2025 – no support for future OpenEdge releases**

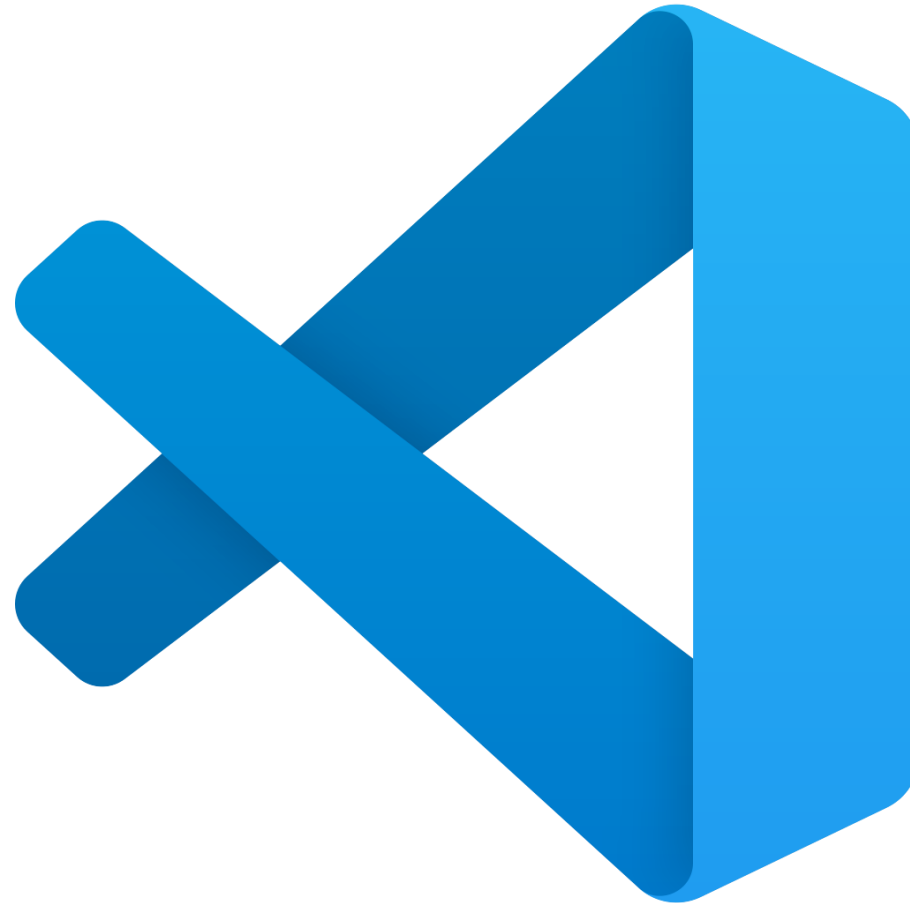- Potentially collateral damage of VS Code and the Riverside Plugin for ABL

Eclipse settings

- Mix of Workspace, Project and installation settings
- Workspace settings are not to be synced via SCM
- Project settings are synced via SCM

VS Code

VS Code – or Visual Studio Code

- It's NOT Visual Studio – thank you Microsoft marketing for the confusion

- Graphical IDE for Windows, Mac, Linux and Web Browsers

- Support for Debugging, Syntax Highlighting, Syntax Checking, Code Refactoring, etc.

- Proprietary but based on open-source variant (MIT License)

- Scales from simple single file editor to full blown project and workspace based IDE

VS Code – or Visual Studio Code

- "In the Stack Overflow 2023 Developer Survey, Visual Studio Code was ranked the most popular developer environment tool among 86,544 respondents, with **73.71%** reporting that they use it." – Wikipedia (EN)

- Probably not exclusive usage – but an indication that also Microsoft .NET and Java developers are more and more moving to VS Code
- The Goto Editor for most Web developers

VS Code – or Visual Studio Code

- Support for various programming languages through extensions and language servers (LSP)

- Lightweight – fast enough to be the everyday text editor for config files etc.

- Scales up to a full-blown integrated developer environment

Demo

- Short Demo of VS Code in Action
- Other sessions at the Conference do a deep dive
  - Gilles Querret
  - Peter Judge
  - Paulius Kuprevičius

Remote Editing on Linux

- VS Code is basically a web application running in the Electron shell
- For Windows development backend and frontend in same machine
- Backend is seamlessly launched with the frontend
- However, it is possible to deploy the backend to Linux or a Mac through SSH
- Using VS Code on Windows to edit files on Linux is way cooler than using PUTTY and VI or mpro
- Build and compile done on Linux

Demo VS Code from Windows to Linux

Demo VS Code from Windows to Linux

Demo VS Code from Windows to Linux

```abl
 */
method public static Progress.Lang.Class FileNameToClass (pcFile
                                                            plThro

    define variable cShortFileName as character      no-und
    define variable oClass         as Progress.Lang.Class no-und
    define variable cExtension      as character      no-und
    define variable cClassName      as character      no-und

    file-information:file-name = pcFileName .

    if file-information:full-pathname = ? then do:
        if plThrowExceptionIfNotType then
            undo, throw new FileNotFoundException(pcFileName).

        return ? .
    end.

    assign cShortFileName = FileHelper:RelativeFileName (file-i

    /* File Name should be .cls or .r */
    assign cExtension = entry (num-entries (cShortFileName, ".":

    if cExtension = "R":U then do:
        rcode-information:file-name = pcFileName .

        if not rcode-information:is-class then do:
            if plThrowExceptionIfNotType then
                undo, throw new RcodeNotTypeException(pcFileName
```

VS Code Extensions

- VS Code has a vibrant ~~Plugin~~ extension ecosystem

- Enhancements to the IDE, support for additional languages or file types, code checkers, unit test runner, …

- VS Code typically updated monthly

- Extension installed via VS Code marketplace or .vsix files (pre-releases or commercial plugins)

- Extension typically automatically updated very frequently

- Riverside extension for OpenEdge supports OpenEdge 11.7, 12.2 and 12.8 with most recent VS Code platform – decouple tooling version from OpenEdge runtime

VS Code Extension

- ABL Unit Runner
- ANT Target Runner
- Code Spell Checker
- File Templates
- Jenkins Jack
- JIRA and Bitbucket
- ResX Editor
- Various plugins for Swagger support
- Show workspace name in status bar

VS Code Extensions

- VS Code includes Git client
- VS Code can be installed by a normal user on Windows as a user application
- This makes VS Code a perfect "emergency" graphical Git Client in customer environments

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VS Code settings

- VS Code has a very smart concept of storing settings
- Folder
- Project (which basically is a folder) plus project configuration
- Workspace
- User (can be synchronized with Microsoft Account)

- Folder, Project and Workspace settings typically JSON files distributed via SCM
- Recommended Plugins for Projects or Workspaces

EXTENSIONS   sonar.p 5   Extension: Ant Target Runner

Search Extensions in Marketplace
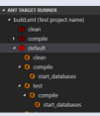
INSTALLED   35

ABLUnit Test Runner   25ms
OpenEdge ABLUnit test runner for VSCo...
Ken Herring

Angular Language Service
Editor services for Angular templates
Angular

Ant Target Runner   17ms
Run Ant targets, manually & automatical...
Nick Heap

Ant Tree Viewer   9ms
Displays a sidebar in Visual Studio Code ...
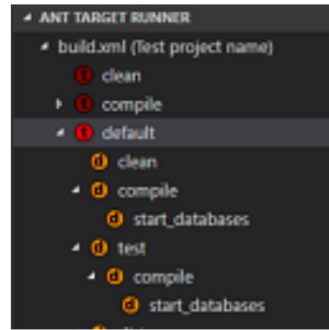Pedro Guerra

C#
Base language support for C#
Microsoft

C# Dev Kit
Official C# extension from Microsoft

RECOMMENDED   0

Ant Target Runner   v0.5.0

Nick Heap | 37,271 | ★★★★☆ (8

Run Ant targets, manually & automatically,...

Disable ⌄   Uninstall ⌄   ☑ Auto Update   ⚙

DETAILS   FEA

✓ Auto Update All (From Publisher)

Copy

Copy Extension ID

Extension Settings

Apply Extension to all Profiles

✓ Sync This Extension

Ignore Recommendation

Remove from Workspace Recommendations

Ant Targ
for Visu
Code

An ant extensio
the root directo
it to look elsewhere) and allows you to
easily run the targets or reveal their
definitions. Ant build output can be

License
Nick Heap

That's all looking great –
but how does that help
an ABL Developer?

VS Code and OpenEdge / ABL

- Extension developed by Riverside Software (Gilles Querret)
- Maintainers of PCT and CABL (SonarQube rules for OpenEdge)
- Partly open-source (extension), language server closed source
- Free of charge
- Works with OpenEdge 11.7, 12.2 and 12.8 and probably beyond
- SonarLint/CABL support through additional plugin
- VS Code updates monthly, so never behind with IDE version

EXTENSIONS

Extension: OpenEdge ABL

Search Extensions in Marketpla...

INSTALLED   35

Codeium   Restart Extensions

copy-json-path
Copy json path under the cursor
nidu

File Templates
Create files based on templates. ...
rioj7

GitLens — Git superch...   526ms
Supercharge Git within VS Code ...
GitKraken

Hitman for PASOE Session Ag...
m-schneider

Jenkins Jack   1375ms
Jack into your Jenkins to streamli...
tabeyti

Jira and Bitbucket (Atl...   166ms
Bringing the power of Jira and Bi...
Atlassian

OpenAPI (Swagger) E...   1153ms
OpenAPI extension for Visual Stu...
42Crunch

OpenEdge ABL   32ms
OpenEdge ABL support for VS C...
Riverside Software

Perforce for VS Code
(2020 Fork) Perforce integration ...
mjcrouch

PowerShell

RECOMMENDED   4

OpenEdge ABL   v1.11.3 (pre-release)

Riverside Software ✔ riverside-software.fr   ⊘ 8,892   ★★★★★ (16)

OpenEdge ABL support for VS Code

Disable ▾ | Uninstall ▾ | Switch to Release Version | ☑ Auto Update ⚙

DETAILS   FEATURES   CHANGELOG

OpenEdge ABL support for Visual Studio Code

This extension provides rich OpenEdge ABL support for Visual Studio Code - Extension page

Current Status

This extension is based on the existing Christophe Camicas work, but went through a complete overhaul due to the addition of the Language Server. This extension is actively maintained, so unless you don't want to switch to the new configuration files, you should use this extension.

Features

- Syntax highlight
- OpenEdge project configuration (propath, database connections, aliases, ...)
- Multi-thread background compiler
- Profiles
- Debugger (legacy and PASOE)
- Code completion

Requirements

This extension requires at least one OpenEdge installation, with a developer license. The

Categories
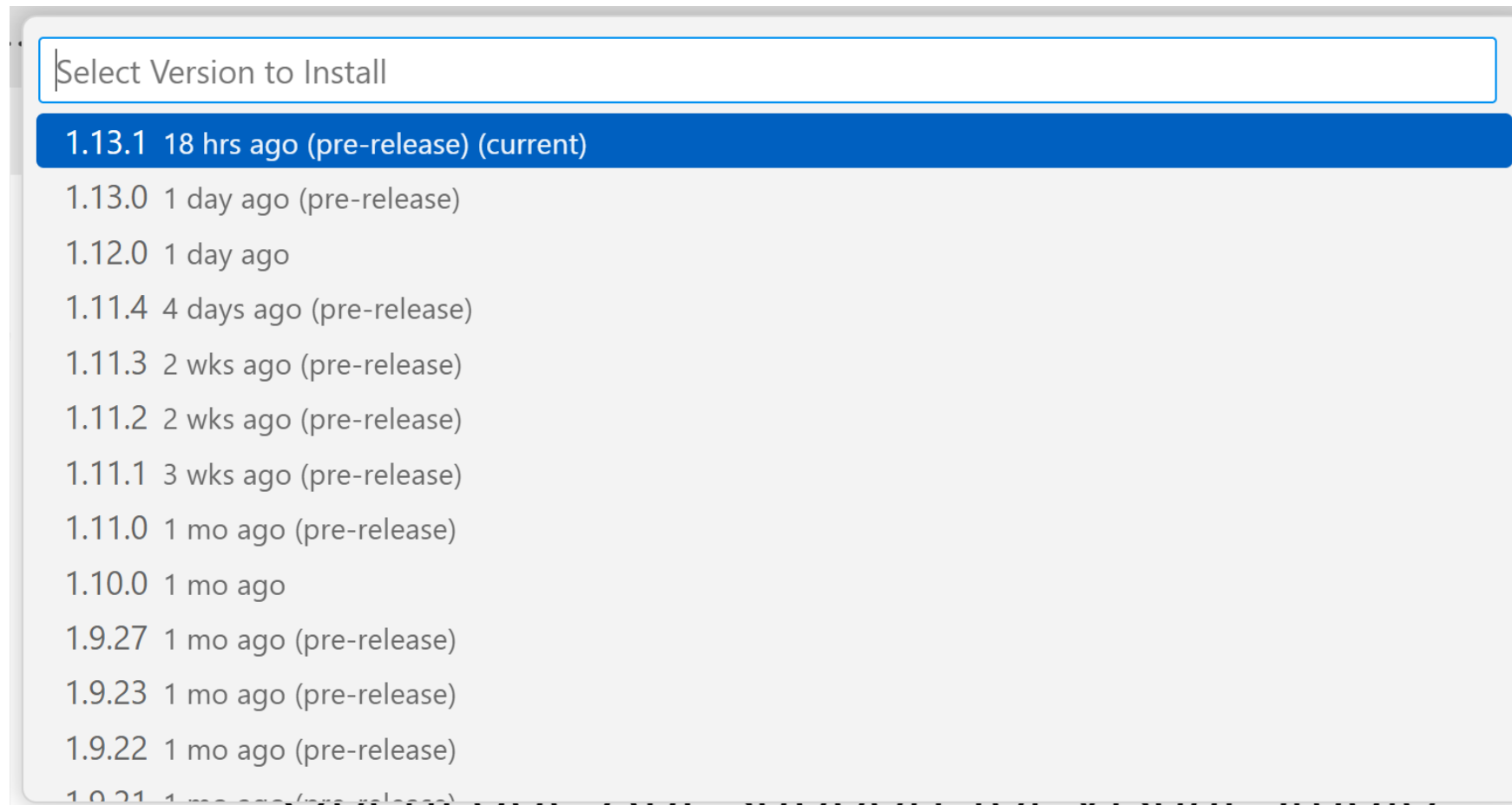
Programming Languages

Snippets   Debuggers

Formatters

Resources

Marketplace
Issues
Repository
License
Riverside Software

More Info

Published	2022-07-06, 10:07:34
Last released	2024-09-16, 07:46:09
Last updated	2024-09-16, 09:47:58
Identifier	riversidesoftware. abl-lsp

© 2024

ABL Plugin under active development

Select Version to Install

1.13.1 18 hrs ago (pre-release) (current)

1.13.0 1 day ago (pre-release)

1.12.0 1 day ago

1.11.4 4 days ago (pre-release)

1.11.3 2 wks ago (pre-release)

1.11.2 2 wks ago (pre-release)

1.11.1 3 wks ago (pre-release)

1.11.0 1 mo ago (pre-release)

1.10.0 1 mo ago

1.9.27 1 mo ago (pre-release)

1.9.23 1 mo ago (pre-release)

1.9.22 1 mo ago (pre-release)

VS Code and OpenEdge / ABL

- Editing with rich code-completion (ABL keywords, include files, procedures, classes and methods/properties)

- Compile with prowin (GUI) or _progress (TTY), compile on Linux

- Fast compilation in multiple threads

- Debugger support (frontend runtime and PASOE)

- Project configuration through JSON file, no property sheets for PROPATH or DB connections

- Profiles to support different configurations, e.g. Progress releases, different Databases during development and test

VS Code and OpenEdge / ABL

- No integrated UI designers
- AppBuilder can be launched from VS Code project with active file
- Data Dictionary can be launched
- No UI designer integration for GUI for .NET

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Additional Plugins for OpenEdge developers

- ABLUnit Test runner
- ProBro – Database Visualizer
- ProPeek – Profiler Visualizer

SCM – Tool

- Surprised to see how many developer teams are not yet using an SCM tool
  - Source code in a shared folder
  - Scripts to copy nightly versions to a parallel folder
  - Something homegrown based on an OpenEdge DB and application

- SCM is more than version control or developer/feature isolation
- SCM is key to developer workflows (e.g. code-reviews)
- SCM is central integration hub for developer tools (Build, Test, Deploy, Check

SCM Tools

- A tool for everyone
- **Git** – the leader, command line great for breaking fingers, works nice with graphical clients (VS Code, GitKraken, Atlassian SourceTree, …)
- **Perforce** – the OpenEdge of SCM tools. Rock solid, easy to use, a well-kept secret, the kind of branching and merging
- **MS TFS** – Microsoft has moved everything to Git, do you really want to be the last one standing on TFS
- **SVN**
- **CVS**
- **…**

SCM - Tool
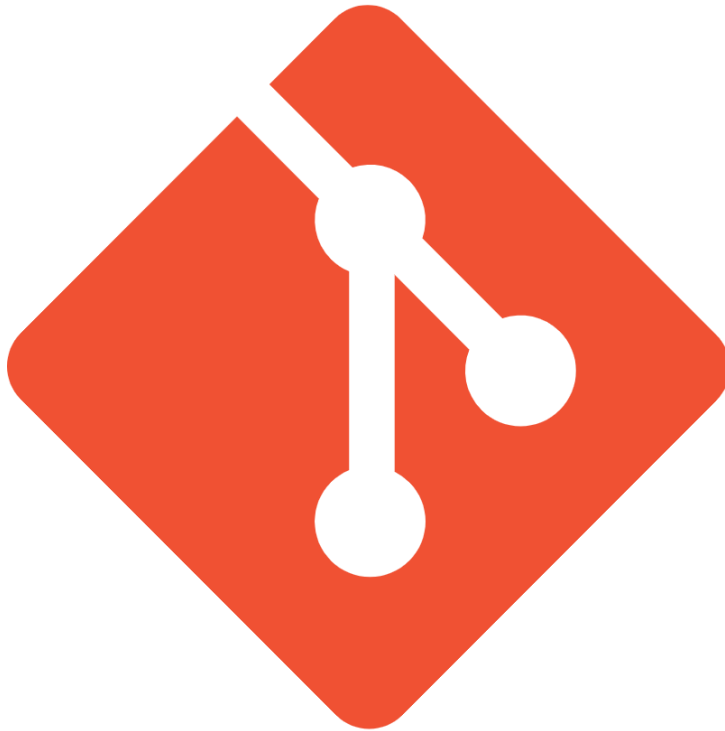
There's a Git for everyone

- Atlassian Bitbucket
- GitHub
- GitLab
- Most Linux distributions provide a basic Git server

- Bitbucket only cloud-based
- GitHub and GitLab available on-premise as well

Git Lens – extended Git support in VS Code

SCM provides central code repository

IDE – Code Editing → Isolated Feature Development → Build Automation → Tests Automation

Deployment Support or Automation ← Maintaining Variants ← Code Review & Pull Requests ← SonarLint Checking
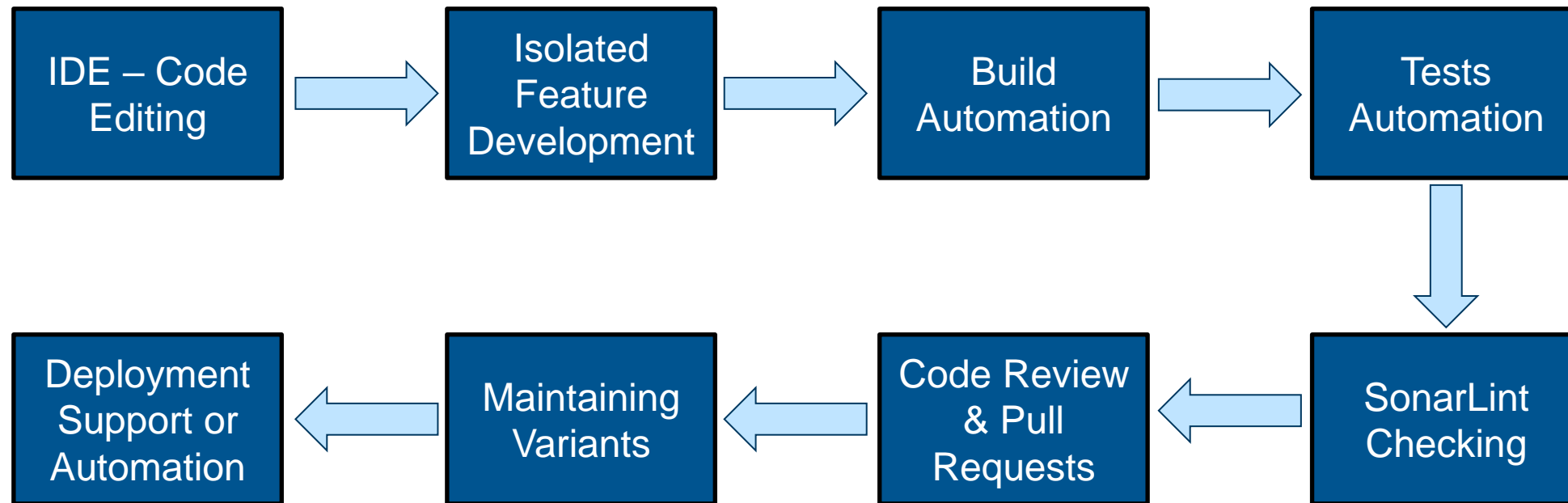
- Hotfixes version releases
- Customization
- OpenEdge release specific changes

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SCM Tool Integration

- Both Progress Developer Studio and VS Code provide integration with various SCM Tools

- Out of the box or via Plugins

- Once plugin is installed, it typically behaves like out of the box

- SCM Tool should provide integration with ticket management (e.g. JIRA or GitHub issues) to provide traceability of changes, e.g. has this fix already been released?

SonarLint / CABL and SonarQube / SonarLint

- Code Analyzer for ABL
- The SonarQube plugin for ABL developers
- Static code analysis for more or less common coding issues
- Visible in Progress Developer Studio and VS Code "while you type"
- SonarLint Dashboard for central monitoring of quality

≡ sonar.p 5 ✕

SmartComponentLibrary › Demo › ≡ sonar.p › ...

```
25
26      define variable i   as integer no-undo.
27      define variable j   as integer no-undo.
28      define variable n   as decimal no-undo.
29      define variable l   as logical no-undo.
30      define variable lc1 as longchar no-undo.
31      define variable lc2 as longchar no-undo.
32
33      if l = true then
34          assign i = 42.
35                  n = 47.11.
36
37      assign lc1 = substitute ("&1 &2":u, i, lc2, n) .
38
```

OUTPUT   PROBLEMS 55   DEBUG CONSOLE   TEST RESULTS   TERMINAL   PORTS   ···   Filter (e.g. text,...   Showing 5 of 55   ▽

⌄ ≡ sonar.p SmartComponentLibrary • Demo 5

⚠ Unused variable j sonarlint(rssw-oe-main:eu.rssw.antlr.proparse.checks.UnusedVariable) [Ln 27, Col 17]

⚠ Variable lc1 is assigned but never read sonarlint(rssw-oe-main:eu.rssw.antlr.proparse.checks.VariableAssignedButNotRead) [Ln 30, Col 17]

⚠ Indentation of statement is not correct sonarlint(rssw-oe-main:eu.rssw.antlr.proparse.checks.IndentationCheck) [Ln 35, Col 12]

⚠ Mixed usage of CHAR and LONGCHAR in SUBSTITUT... sonarlint(rssw-oe-main:eu.rssw.antlr.proparse.checks.SubstituteLongChar) [Ln 37, Col 1]

⚠ 2 parameter(s) expected by SUBSTITUTE function, ... sonarlint(rssw-oe-main:eu.rssw.antlr.proparse.checks.SubstituteParameters) [Ln 37, Col 26]

Overview   Vorgänge   Security Hotspots   Maße   Code   Activity   Project Settings ▾   ☰ Project Information

QUALITY GATE STATUS ❔

Passed

All conditions passed.

⚠ The quality gate used by this project does not comply with Clean as You Code.

Fixing this quality gate will help you achieve a Clean Code state.

↗ Learn why

MEASURES

New Code	Overall Code
New Code From last 14 days	

0 🐛 New Bugs   Reliability Ⓐ

0 🔒 New Vulnerabilities   Security Ⓐ

0 🛡 New Security Hotspots ❔   — Reviewed   Security Review Ⓐ

2St 10Min Added Debt   **12** ☢ New Code Smells   Maintainability Ⓐ

78,5% Coverage on 1k New Lines to cover

1,27% Duplications on 3,2k New Lines

Unit Test coverage

Veränderte Abdeckung **41,9%**

	Veränderte Abdeckung	Neue nicht abgedeckte Quellcodezeilen	Neue nicht abgedeckte Bedingungen
📄 Consultingwerk/BusinessEntityDesigner/Plugins/ActionTypePlugin.cls	0,0%	1	0
📄 Consultingwerk/BusinessEntityDesigner/Plugins/AssignSkipListPlugin.cls	0,0%	21	0
📄 Consultingwerk/ClassName.cls	0,0%	8	0
📄 Consultingwerk/Util/MessageFormHelper.cls	0,0%	12	0
📄 Consultingwerk/Framework/Http/RestClient.cls	0,0%	86	0
📄 Consultingwerk/Util/BufferHelper.cls	25,0%	6	0
📄 Consultingwerk/Framework/Http/SmartHttpClient.cls	28,6%	10	0
📄 Consultingwerk/SmartFramework/Repository/Tools/RepositoryObjectExporter.cls	65,4%	37	0
📄 Consultingwerk/Util/FileHelper.cls	85,7%	1	0

© 2

Unit Test coverage

SmartComponent Library / Consultingwerk / Util / FileHelper.cls

```
618   …
619          /**
620           * Purpose: Returns the directory portion of a file name, absolutely or relatively
621           * Notes:
622           * @param pcFileName The base file name
623           * @return The directory portion of the file name
624           */
625   …    method public static character DirectoryName (pcFileName as character):
626   …
627   …        define variable iIndex as integer no-undo.
628   …
629   …        if opsys = "MS-DOS":U or opsys = "WIN32":U then
630              assign pcFileName = replace (pcFileName, "~\":U, "/":U) .
631   …
632   …        iIndex = r-index (pcFileName, "/":U) .
633   …
634   …        if iIndex > 1 then
635              return substring (pcFileName, 1, iIndex - 1, "character":U) .
636   …        else
637              return "":u.
638   …
639   …        return pcFileName .
640   …
641   …    end method .
```

SonarLint / CABL and SonarQube / SonarLint

- SonarQube dashboard requires integration into Build process (SCM)
- SonarQube community edition, single branch only
- SonarQube commercial edition with support for feature-branches

- CABL rules, commercial product from Riverside

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SmartComponent Library

Unit Testing

Unit Tests are life savers - a true story

- Last week during testing of OpenEdge 12.8.4

- 5 Unit tests (out of 19.000) failing after upgrade of build server to OpenEdge 12.8.4 – time to notice < 30 minutes

- Probably a bug fix introduced behavior change in READ-XML of ProDataset (confirmed as a "critical" bug now):

  OCTA-61964: "ProDataSet READ-XML and READ-JSON methods cause the ABL session to crash when the XML/JSON document mistakenly contains a record nested inside of itself."

- Workaround implemented and tested in ~ 4 hours

ABL Unit provided by Progress Software

- Integrated into Progress Developer Studio
- ANT Tasks for Build Automation
- Integrated into VS Code through ABL Unit Task Runner
- Similar concepts as JUnit, NUnit, …

- SmartUnit for SmartComponent Library customers
  - tests are compatible
  - but additional support for configuration of test environment
  - mocking of application data and services

Demo

- ABL Unit in Progress Developer Studio

TESTING   🔄 ▷∨ 🔂 ⊞ ⋯

nTestRunner.cls   {} CustomerForm.json 9+   ☁ OrderPresentationService.cls 3   ☁ UnitTest.cls 4 ✕   ← 🔍 ⋯

PresentationService   ▽

⊗ 0/2   3.6s 🔄

omponentsDemo › PresentationService › ☁ UnitTest.cls › 🏗 Consultingwerk.SmartComponentsDemo.PresentationService.UnitTest

```
14    class Consultingwerk.SmartComponentsDemo.PresentationService.UnitTest:
15
16        {Consultingwerk/SmartComponentsDemo/OERA/Sports2000/dsOrder.i}
17
18        @Test.
19        method public void TestMethod():    Value "Lift Skiing" does not equal
20
21            define variable oService   as OrderPresentationService no-undo.
22            define variable oUiControl as UiControl                no-undo.
23
24            oService = new OrderPresentationService().
25
26            dataset dsOrder:read-xml ("file":u,
27                                      "Consultingwerk/SmartComponentsDemo/Pres
28                                      ?, ?, ?).
29
30            find first eOrder.
31            assign eOrder.CustNum = 1 . /* new screen-value */
32
33            oUiControl = oService:HandleCustNumChanged (dataset dsOrder,
```

∨ ⊗ SmartComponentLibrary WorkspaceFolder: 0.0ms
  ∨ ⊗ Consultingwerk ABLTestDir: 0.0ms
    ∨ ⊗ SmartComponentsDemo ABLTestDir: 0.0ms
      ∨ ⊗ PresentationService ABLTestDir: 0.0ms
        ∨ ⊗ UnitTest.cls ABL Test Class: 0.0ms
          ⊗ TestMethod ABL Test Meth... ▷ 🔂 🗐
          ⊗ TestMethod2 ABL Test Method: 0.0ms
  › ⊘ Demo ABLTestDir

OUTPUT   PROBLEMS 187   DEBUG CONSOLE   TEST RESULTS   TERMINAL   PORTS   FIELDS EXPLORER   ⋯   ⌄ ✕

----- ABLUnit Command Execution Started -----
----- ABLUnit Command Execution Completed -----
Totals - 2 tests, 0 passed, 0 errors, 2 failures, 0 skipped
TestMethod failed! Value "Lift Skiing" does not equal "Lift
TestMethod failed! Value "Lift Skiing" does not equal "Lift
TestMethod2 failed! Value "Lift Skiing" does not equal "Lif
TestMethod2 failed! Value "Lift Skiing" does not equal "Lif

ABLUnit Test Runner   >_
⊗ TestMethod Value "Lift Skiing" doe...
⊗ TestMethod2 Value "Lift Skiing" d...
› 16 older results

TESTING   ↻ ▷∨ ▷⊘ ⌄_ ···

dationTestRunner.cls   {} CustomerForm.json   ☁ OrderPresentationService.cls   ☁ UnitTest.cls 4 ⊗

PresentationService   ▽

⊗ 0/2   3.6s ↻

omponentsDemo › PresentationService › ☁ UnitTest.cls › ⊹ Consultingwerk.SmartComponentsDemo.PresentationService.UnitTest

```
14    class Consultingwerk.SmartComponentsDemo.PresentationService.UnitTest:
19        method public void TestMethod():    Value "Lift Skiing" does not equal
```

∨ ⊗ SmartComponentLibrary WorkspaceFolder: 0.0ms

```
26            dataset dsOrder:read-xml ("file":u,
27                                      "Consultingwerk/SmartComponentsDemo/Pres
28                                      ?, ?, ?).
29
```

  ∨ ⊗ Consultingwerk ABLTestDir: 0.0ms

```
30            find first eOrder.
31            assign eOrder.CustNum = 1 . /* new screen-value */
32
```

    ∨ ⊗ SmartComponentsDemo ABLTestDir: 0.0ms

```
33            oUiControl = oService:HandleCustNumChanged (dataset dsOrder,
34                                new EventHandlerParame
```

      ∨ ⊗ PresentationService ABLTestDir: 0.0ms

```
35
36            find first eOrder.
37
```

        ∨ ⊗ UnitTest.cls ABL Test Class: 0.0ms

```
38            Assert:Equals(eOrder.CustName, "Lift Line Skiing":u) . /* name of
39            Assert:Equals(oUiControl:FieldControl("Instructions":u):Style, "er
40
```

            ⊗ TestMethod ABL Test Meth... ▷ ▷⊘ ⎘

```
41        end method.
42
```

            ⊗ TestMethod2 ABL Test Method: 0.0ms

  › ✓ Demo ABLTestDir

OUTPUT   PROBLEMS 37   DEBUG CONSOLE   TEST RESULTS   TERMINAL   PORTS   FIELDS EXPLORER   ···

```
----- ABLUnit Command Execution Started -----
----- ABLUnit Command Execution Completed -----
Totals - 2 tests, 0 passed, 0 errors, 2 failures, 0 skipped
TestMethod failed! Value "Lift Skiing" does not equal "Lift
TestMethod failed! Value "Lift Skiing" does not equal "Lift
TestMethod2 failed! Value "Lift Skiing" does not equal "Lif
TestMethod2 failed! Value "Lift Skiing" does not equal "Lif
```

ABLUnit Test Runner   ⟩_
  ⊗ TestMethod Value "Lift Skiing" doe...
  ⊗ TestMethod2 Value "Lift Skiing" d...
  › 16 older results

TESTING   🔄 ▶▽ ▷ 🖥 ···

nTestRunner.cls   {} CustomerForm.json 9+   🌊 OrderPresentationService.cls 3   🌊 UnitTest.cls 4 ✕

PresentationService   ▽

PresentationService > 🌊 UnitTest.cls > 🔧 Consultingwerk.SmartComponentsDemo.PresentationService.UnitTest > 🔷 TestMethod()

⊗ 0/2   3.6s 🔄

```
14   class Consultingwerk.SmartComponentsDemo.PresentationService.UnitTest:
15
16       {Consultingwerk/SmartComponentsDemo/OERA/Sports2000/dsOrder.i}
17
18       @Test.
19       method public void TestMethod():    Value "Lift Skiing" does not equal
```

∨ ⊗ SmartComponentLibrary WorkspaceFolder: 0.0ms
  ∨ ⊗ Consultingwerk ABLTestDir: 0.0ms
    ∨ ⊗ SmartComponentsDemo ABLTestDir: 0.0ms
      ∨ ⊗ PresentationService ABLTestDir: 0.0ms
        ∨ ⊗ UnitTest.cls ABL Test Class: 0.0ms
            ⊗ TestMethod ABL Test Meth... ▶ ▷ 📋

Value "Lift Skiing" does not equal "Lift Line Skiing"

ABL Stack Trace

```
--> Equals Consultingwerk.Assertion.Assert at line 743
(Consultingwerk/Assertion/Assert.cls:57)
    TestMethod
Consultingwerk.SmartComponentsDemo.PresentationService.UnitTest
at line 1488
(Consultingwerk/SmartComponentsDemo/PresentationService/UnitTest.cls:38)
    InvokeTestMethod OpenEdge.ABLUnit.Model.TestClass at line
82 (OpenEdge/ABLUnit/Model/TestClass.r)
```

            ⊗ TestMethod2 ABL Test Method: 0.0ms
  > ✓ Demo ABLTestDir

Value "Lift Skiing" does not equal "Lift L

Value "Lift Skiing" does not equal "Lift L

ABL Stack Trace

```
--> Equals Consultingwerk.Asse
(Consultingwerk/Assertion/Ass
    TestMethod Consultingwerk.
line 1488 (Consultingwerk/Sma
    InvokeTestMethod OpenEdge.
(OpenEdge/ABLUnit/Model/TestC
    RunChild OpenEdge.ABLUnit.
(OpenEdge/ABLUnit/Model/TestCase.i)
```

OUTPUT   PROBLEMS 187   DEBUG CONSOLE   **TEST RESULTS**   TERMINAL   PORTS   FIELDS EXPLORER   ···

```
----- ABLUnit Command Execution Started -----
----- ABLUnit Command Execution Completed -----
Totals - 2 tests, 0 passed, 0 errors, 2 failures, 0 skipped
TestMethod failed! Value "Lift Skiing" does not equal "Lift
TestMethod failed! Value "Lift Skiing" does not equal "Lift
TestMethod2 failed! Value "Lift Skiing" does not equal "Lif
TestMethod2 failed! Value "Lift Skiing" does not equal "Lif
```
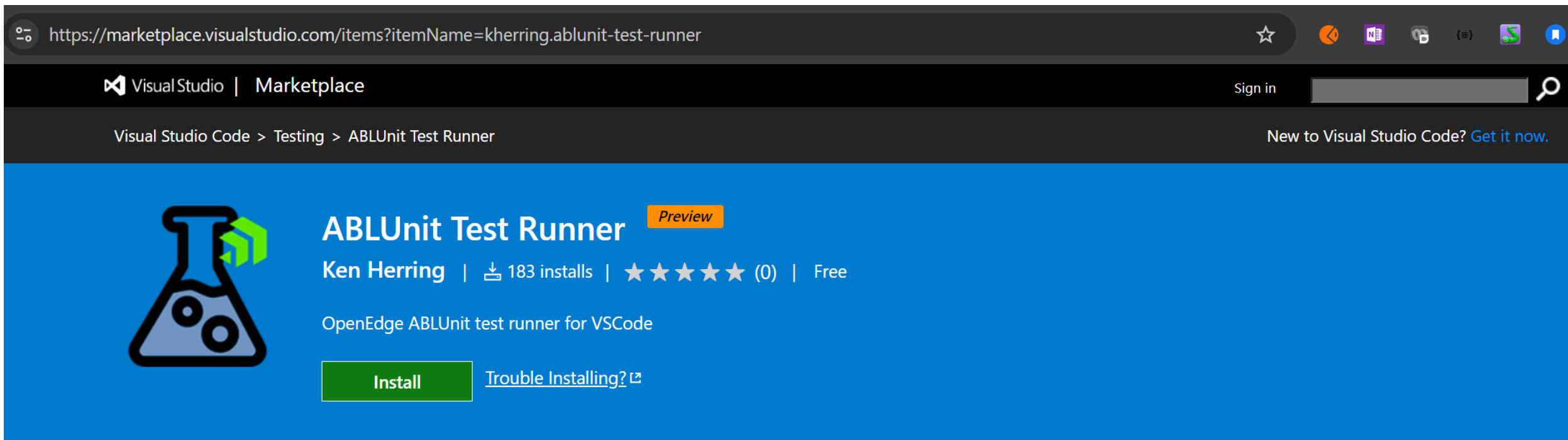
ABLUnit Test Runner   🖥
  ⊗ TestMethod Value "Lift Skiing" doe...
  ⊗ TestMethod2 Value "Lift Skiing" d...
> 16 older results

ABL Unit Test Runner

- https://marketplace.visualstudio.com/items?itemName=kherring.ablunit-test-runner

ABL Unit Test Runner

- Code coverage was indicated „in the source" by highlighting lines in light green or red

- Known issue – test failures only indicted when test class has 2 or more test methods …

- Well, you need to test for good *and* bad anyway ;)

Additional Code & DB checks implemented as Unit tests

- Method comments and parameter comments
- Localizable setting in GUI for .NET (.resx file scanning)
- DB Schema tests
  - Trigger path with forward slash and without src
  - Unique Index
  - No tables/fields/lobs in scheme-area
  - UTF-8 code page for lobs
  - …
- Executed as specialized test-runners in our of Unit test tool (SmartUnit)

```abl
 32   class Consultingwerk.SmartUnit.SchemaValidation.SchemaValidationTestRunner

 93       /**
 94        * Purpose: Executes test that CLOB's have a UTF codepage
 95        * Notes:
 96        */
 97       method protected void ExecuteClobCPTest ():
 98
 99           for each dictdb._field where _Field._Data-Type   = "CLOB":U
100                                   and not _Field._Charset begins "UTF":U
101               no-lock,
102               first dictdb._file where recid (dictdb._file) = dictdb._field._File-recid
103                                   and dictdb._file._File-Number > 0 and dictdb._file._File-
104               no-lock:
105
106               create eTestcase.
107               assign eTestcase.TestsuiteName = eTestsuite.TestsuiteName
108                      eTestcase.ClassName     = substitute ("&1.&2.field_&3":U, ldbname ("dic
109                      eTestcase.TestcaseName  = "CodePage":U
110                      eTestcase.ErrorMessage  = "CLOB Code Page is not unicode":U .
111               release eTestcase.
112           end .
113
114       end method .
115
```

Unit Tests in Jenkins
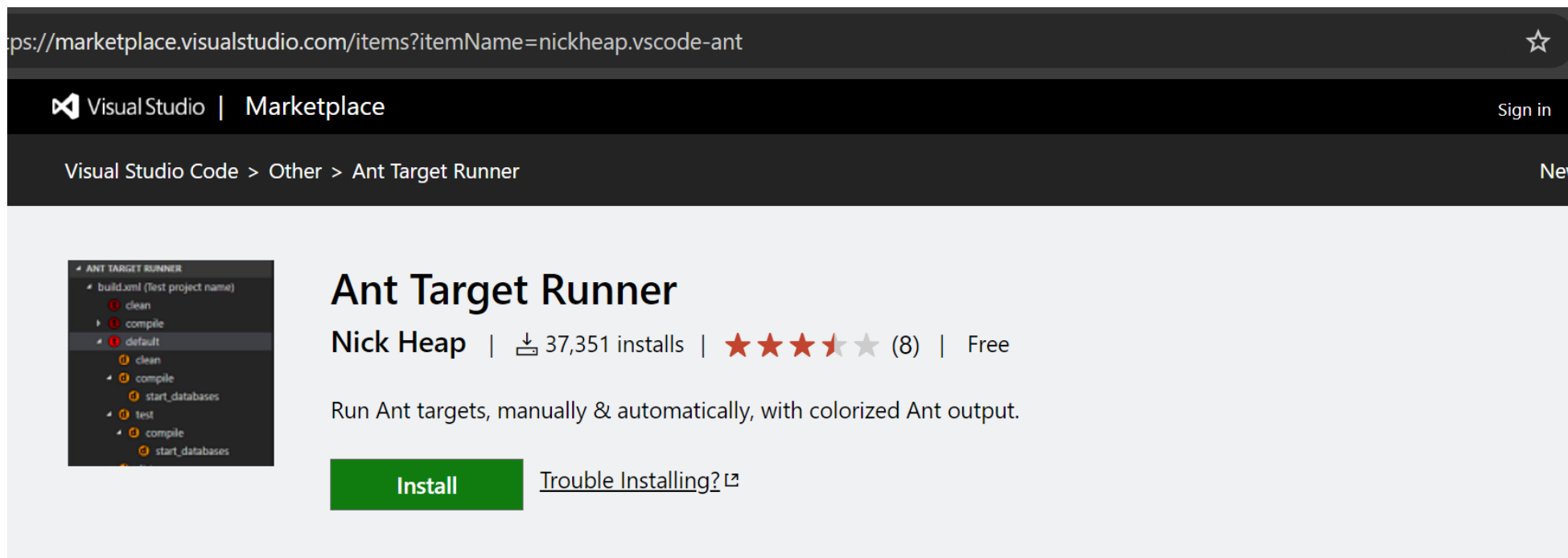
Unit Tests in Jenkins

- Jenkins Build Server executes Unit Tests after every commit

- Currently 19.000 Unit Test executed in ~ 12 minutes

- Executed in parallel – with all the joy

- Unit Tests become the typical type of ad-hoc testing by developers (test-first development) – running code for testing from a simple .p feels like a waste of time

ANT Build Jobs

- Progress Developer Studio: Ant Builder out of the box
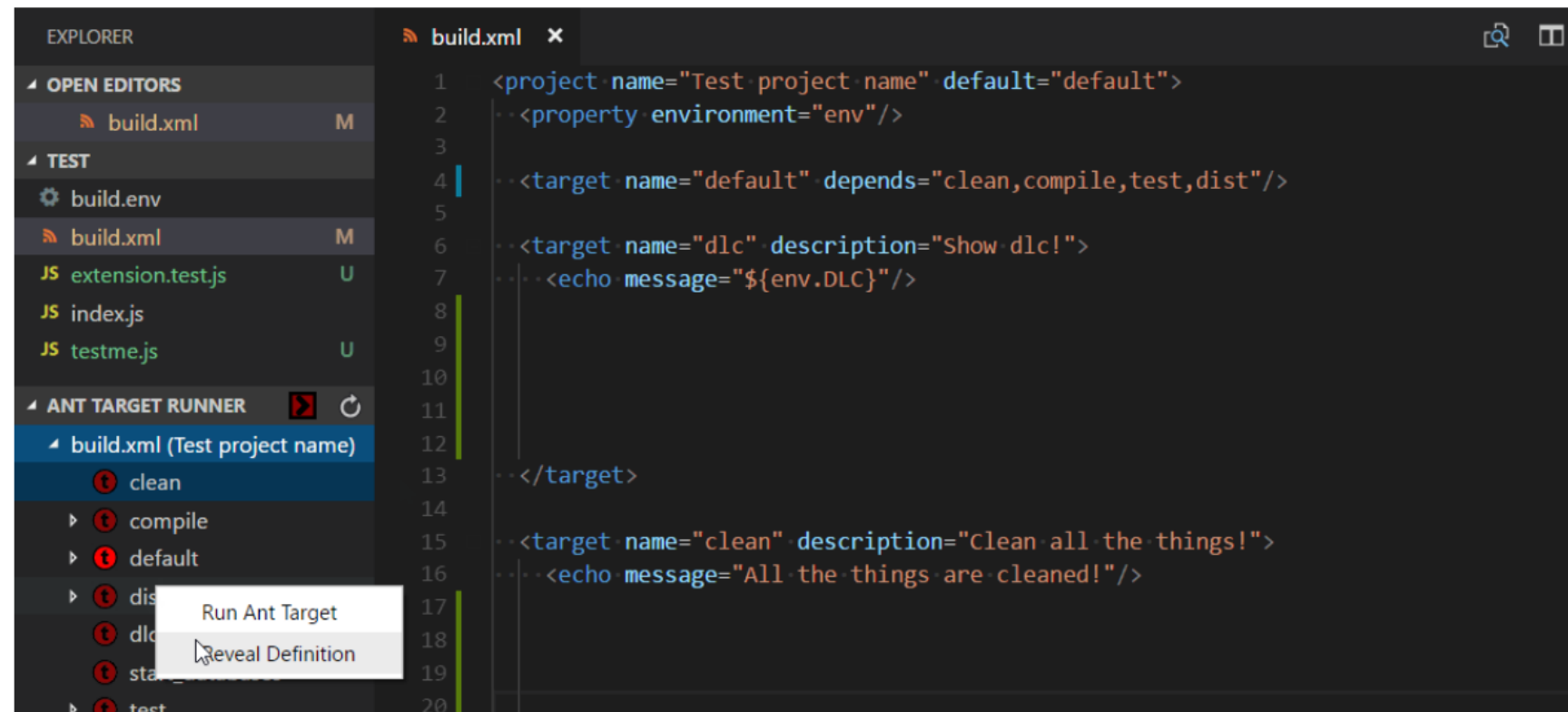- VS Code: Ant Target Runner plugin

Ant Target Runner

- https://marketplace.visualstudio.com/items?itemName=nickheap.vscode-ant

Ant Target Runner

- Actually, not OpenEdge specific
- Developed by an OpenEdge developer, see the sample on the marketplace page

GenAI

AI

- First touching points in 2023
- PUG Challenge Session by Helmes, consuming SmartComponent Library REST Services from ChatGPT
  - Natural language queries in Sports2000 application
  - Based on Open-API (Swagger) and RESTful API of SmartComponent Library
- Similar initiatives by customers in 2023

GenAI

"Generative artificial intelligence (generative AI, GenAI, or GAI) is artificial intelligence capable of generating text, images, videos, or other data using generative models, often in response to prompts. Generative AI models learn the patterns and structure of their input training data and then generate new data that has similar characteristics."

"Generative AI has uses across a wide range of industries, including software development, healthcare, finance, entertainment, customer service, sales and marketing, art, writing, fashion, and product design."

https://en.wikipedia.org/wiki/Generative_artificial_intelligence

The full stack modernization framework
SmartComponent Library

GenAI in Software development

- Supporting of developers while writing code
- More intelligen proposals while coding
- Chat: „write me a method that solves XYZ ", „write me a unit test for this method "), Boiler Plate Code – the new kind of wizards
- Refactoring of Code
- Explanation of Code, proposal for comments
- Understanding of the context
  - Programming languages
  - Frameworks
  - Application model / Terms, e.g. Database schema

Codeium

- AI Assistant for Software developer
- 70 programming language – no ABL support out of the box ☹
- 40 IDE's (including VS Code and Eclipse), works in PDSOE 12.8
- Used at Consultingwerk since end of march
- Resulting proposals improved day by day

```
define variable cCustomerName as character no-undo.
define variable i               as integer   no-undo.
define variable iCount          as integer   no-undo.
define variable deAverage       as decimal   no-undo.
```

```
method public void ProcessOrder (piOrderNum as integer):

    define variable oOrder as OrderDatasetModel no-undo.
    define variable oCustomer as CustomerDatasetModel no-undo.

    oOrder = new OrderDatasetModel().
    oOrder:Order:Filter:Ordernum:EQ(piOrderNum):Run().

    if not oOrder:Order:Available then
        undo, throw new AppError("Order not found", 0).

    oCustomer = new CustomerDatasetModel().
    oCustomer:Customer:Filter:CustNum:EQ(oOrder:Order:CustNum):Run().

    if not oCustomer:Customer:Available then
        undo, throw new AppError("Customer not found", 0).
```

```
WHEN JsonDataType:NUMBER THEN DO:
    IF JsonHelper:IsIntegerProperty (poJson, cProperty) THEN DO:
        IF LOG-MANAGER:LOGFILE-NAME <> ? OR SESSION:REMOTE OR SESSION:CLIENT-TYPE = "WEBSPEED":U THEN
            LOG-MANAGER:WRITE-MESSAGE (SUBSTITUTE ("### Setting '&1' to INTEGER '&2'":U,
                                                  cProperty,
                                                  poJson:GetInteger (cProperty)),
                                       "Startup":U) .

        DYNAMIC-PROPERTY (ENTRY (1, cProperty, ":":U),
                          ENTRY (2, cProperty, ":":U)) = poJson:GetInteger (cProperty) .
    END.
    ELSE IF JsonHelper:IsInt64Property (poJson, cProperty) THEN DO:
        IF LOG-MANAGER:LOGFILE-NAME <> ? OR SESSION:REMOTE OR SESSION:CLIENT-TYPE = "WEBSPEED":U THEN
            LOG-MANAGER:WRITE-MESSAGE (SUBSTITUTE ("### Setting '&1' to INTEGER '&2'":U,
                                                  cProperty,
                                                  poJson:GetInt64 (cProperty)),
                                       "Startup":U) .

        DYNAMIC-PROPERTY (ENTRY (1, cProperty, ":":U),
                          ENTRY (2, cProperty, ":":U)) = poJson:GetInt64 (cProperty) .
    END.
    ELSE DO:
        IF LOG-MANAGER:LOGFILE-NAME <> ? OR SESSION:REMOTE OR SESSION:CLIENT-TYPE = "WEBSPEED":U THEN
            LOG-MANAGER:WRITE-MESSAGE (SUBSTITUTE ("### Setting '&1' to INTEGER '&2'":U,
                                                  cProperty,
                                                  poJson:GetDecimal (cProperty)),
                                       "Startup":U) .

        DYNAMIC-PROPERTY (ENTRY (1, cProperty, ":":U),
                          ENTRY (2, cProperty, ":":U)) = poJson:GetDecimal (cProperty) .
    END.
END.
```

```abl
WHEN JsonDataType:NUMBER THEN DO:
    IF JsonHelper:IsIntegerProperty (poJson, cProperty) THEN DO:
        LogManager:WriteFormattedMessage("### Setting '&1' to INTEGER '&2'":U,
                                cProperty,
                                poJson:GetInteger (cProperty),
                                NEW MessageSubSystem("StaticProperties":U)) .


        DYNAMIC-PROPERTY (ENTRY (1, cProperty, ":":U),
                            ENTRY (2, cProperty, ":":U)) = poJson:GetInteger (cProperty) .
    END.
    ELSE IF JsonHelper:IsInt64Property (poJson, cProperty) THEN DO:
        LogManager:WriteFormattedMessage("### Setting '&1' to INTEGER '&2'":U,
                                cProperty,
                                poJson:GetInt64 (cProperty),
                                NEW MessageSubSystem("StaticProperties":U)) .


        DYNAMIC-PROPERTY (ENTRY (1, cProperty, ":":U),
                            ENTRY (2, cProperty, ":":U)) = poJson:GetInt64 (cProperty) .
    END.
    ELSE DO:
        LogManager:WriteFormattedMessage("### Setting '&1' to DECIMAL '&2'":U,
                                cProperty,
                                poJson:GetDecimal (cProperty),
                                NEW MessageSubSystem("StaticProperties":U)) .

        IF LOG-MANAGER:LOGFILE-NAME <> ? OR SESSION:REMOTE OR SESSION:CLIENT-TYPE = "WEBSPEED":U THEN
            LOG-MANAGER:WRITE-MESSAGE (SUBSTITUTE ("### Setting '&1' to INTEGER '&2'":U,
                                cProperty,
                                poJson:GetDecimal (cProperty)),
                        "Startup":U) .


        DYNAMIC-PROPERTY (ENTRY (1, cProperty, ":":U),
                            ENTRY (2, cProperty, ":":U)) = poJson:GetDecimal (cProperty) .
    END.
```