ELEVATE 2024

New Development Features in PowerBuilder 2025

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Session Agenda

- Integrating PBC into PBAutoBuild (demo)
- Supporting high DPI (demo)
- Connecting with PostgreSQL via ADO.NET driver (demo)
- Upgrading to .NET 8 and removing .NET Framework dependency
- SMTPClient supports various authentication type
- Theme enhancement
- TabbedView enhancement (demo)
- DataWindow enhancements
- Source control enhancements (demo)
- PDF Builder enhancements (demo)
- Supporting multiple display monitors (demo)
- Supporting Placeholder property for EditMask and MultiLineEdit (demo)
- Installer changes
- Discontinued/Obsolete Features

Presenter Profile

Bruce Armstrong

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Recent Projects

- OpenSourcePFCLibraries - The open-source PowerBuilder Foundation Class libraries

Key Skills

- PowerBuilder
- Oracle PL/SQL
- Java
- C#
- C++

Company Profile

Integrated Data Services

IDS has delivered innovative program and financial management information system solutions to the Federal Government for nearly three decades. Our flagship Enterprise Requirements Management product, CCaR™ is used by the DoD and Federal Agencies including the Air Force, Space Force, Army, USSOCOM, DSCA, DHA, JSF and DOE.

Integrating PBC into PBAutoBuild

- PowerBuilder Compiler (PBC) is integrated into PBAutoBuild. The PBC parameters will be supported by PBAutoBuild if you add /pbc parameter to the PBAutoBuild command (to switch to the PBC approach).
- For PowerServer and PowerClient projects, PBAutoBuild supports deploying only (in addition to compiling and deploying). If the project has been compiled before, you can use /deploy parameter to skip compiling the project again.

Demo:

Integrating PBC into PBAutoBuild

Supporting high DPI

- Windows provides several DPI awareness modes:
  - DPI Unaware
    - Always render at a fixed DPI scale of 96 (100%)
  - System DPI Awareness
    - Adjusts to initial DPI of primary monitor, do not respond to DPI changes
  - Per Monitor (V1) DPI Awareness
    - Responds to DPI changes, but is very limited
  - Per-Monitor (V2) DPI Awareness
    - Responds to DPI changes, recommended setting
  - DPI Unaware GDI Scaled
    - Uses GDI Scaling rather than DPI settings to try to improve application appearance

Supporting high DPI

- For more information on what the different settings do see:
  - https://learn.microsoft.com/en-us/windows/win32/hidpi/high-dpi-desktop-application-development-on-windows
- For information on how to set the DPI awareness via a manifest file see:
  - https://learn.microsoft.com/en-us/windows/win32/hidpi/setting-the-default-dpi-awareness-for-a-process#setting-default-awareness-with-the-application-manifest
- For information on GDI Scaling see:
  - https://blogs.windows.com/windowsdeveloper/2017/05/19/improving-high-dpi-experience-gdi-based-desktop-apps/

Supporting high DPI

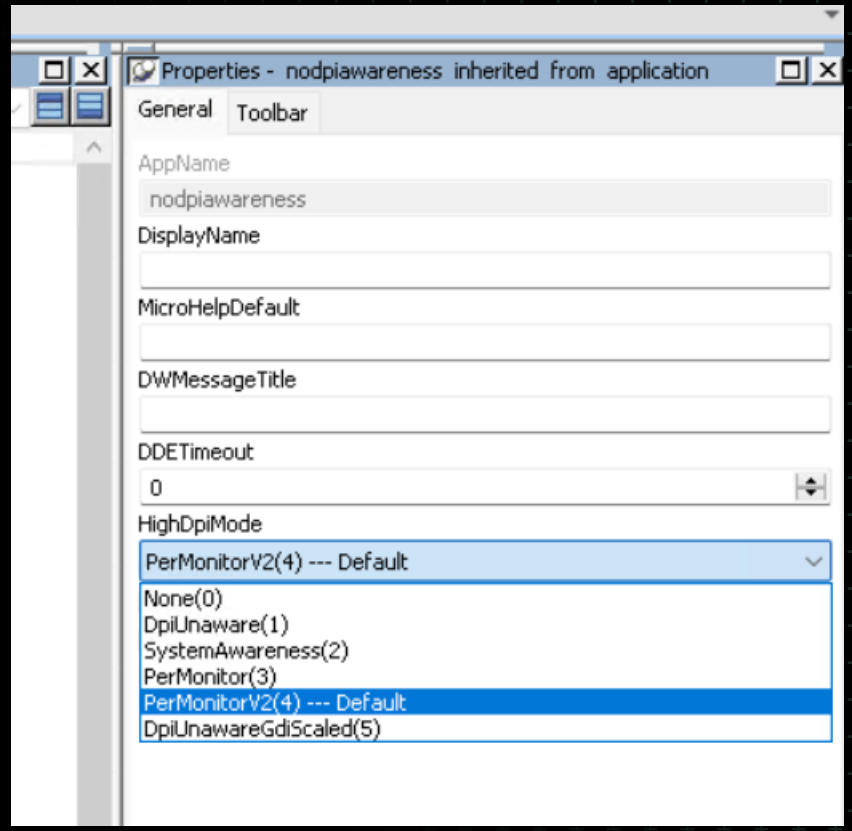
- You can configure which mode the PowerBuilder application supports, through the following property or function:
  - Application HighDPIMode property
  - Application SetHighDPIMode function
- Valid values are:
  - 0 – None
  - 1 – DpiUnaware
  - 2 – SystemAwareness
  - 3 – PerMonitor
  - 4 - PerMonitorV2
  - 5 - DpiUnawareGdiScaled

Supporting high DPI

- The DPI mode can be set in several ways and will take effect in the following order: application executable property > manifest file > Windows API.
- If the setting is anything other than None(0) at the application property, then that setting will apply and no later setting will take effect.
- If you want to set the mode via the object property in script of using the SetHighDpiMode method, then the application property setting in the IDE must be None(0). (Otherwise, that would override the script).
- If you are setting mode in script using the application property or using SetHighDpiMode, then it must be done before a window is opening in the app, otherwise it will no take effect.
- The feature will work only in Windows 10 (version 1703) or later and Windows Server 2016 or later. For earlier versions of Windows, the application will act as if None(0) has been selected.
- The application must be compiled for the setting to be effective; it has no effect when the application is run from the IDE.

Supporting high DPI

- If you create a new PowerBuilder application from scratch, it will be set to 4 - PerMonitorV2
- If you upgrade a PowerBuilder application from an earlier version, it will be set to 0 - None



Supporting high DPI

- If Per-Monitor (V2) is used Windows sends the following events when there is a DPI change that affects your application
  - WM_DPICHANGEDBEFOREPARENT (event ID 738)
    - Sent to children of the top-level window of the application before WM_DPICHANGED is sent
  - WM_DPICHANGED (event ID 736)
    - Sent to the top-level window of the application
  - WM_DIPCHANGEAFTERPARENT (event ID 739)
    - Sent to the children of the top-level window of the application after WM_DPICHANGED is sent
- None of these events have a pbm_xxxxxxxxxx event defined for them in PowerBuilder, so you will need to capture them in the Other event

Supporting high DPI

- WM_DPICHANGEDBEFOREPARENT
  - the wparam and lparam values are unused (they are always 0)
- WM_DPICHANGEDAFTERPARENT
  - the wparam and lparam values are unused (they are always 0)
- WM_DPICHANGED
  - Wparam
    - The high word is the new DPI for the Y-axis and the low word is the new DPI for the X-axis
    - For Windows applications these are always the same value
  - Lparam
    - A pointer to a RECT structure that contains the recommended location and size for the top-level window based on the new DPI

Supporting high DPI

- Capturing the messages in the Other event

```
1  CHOOSE CASE message.number
2     CASE 736
3        st_2.text = "WM_DPICHANGED"
4        of_process_dpichanged(wparam, lparam)
5     CASE 738
6        st_2.text = "WM_DPICHANGEDBEFOREPARENT"
7     CASE 739
8        st_2.text = "WM_DPICHANGEDAFTERPARENT"
9  END CHOOSE
10
11
```

Supporting high DPI

- Decoding the message parameters

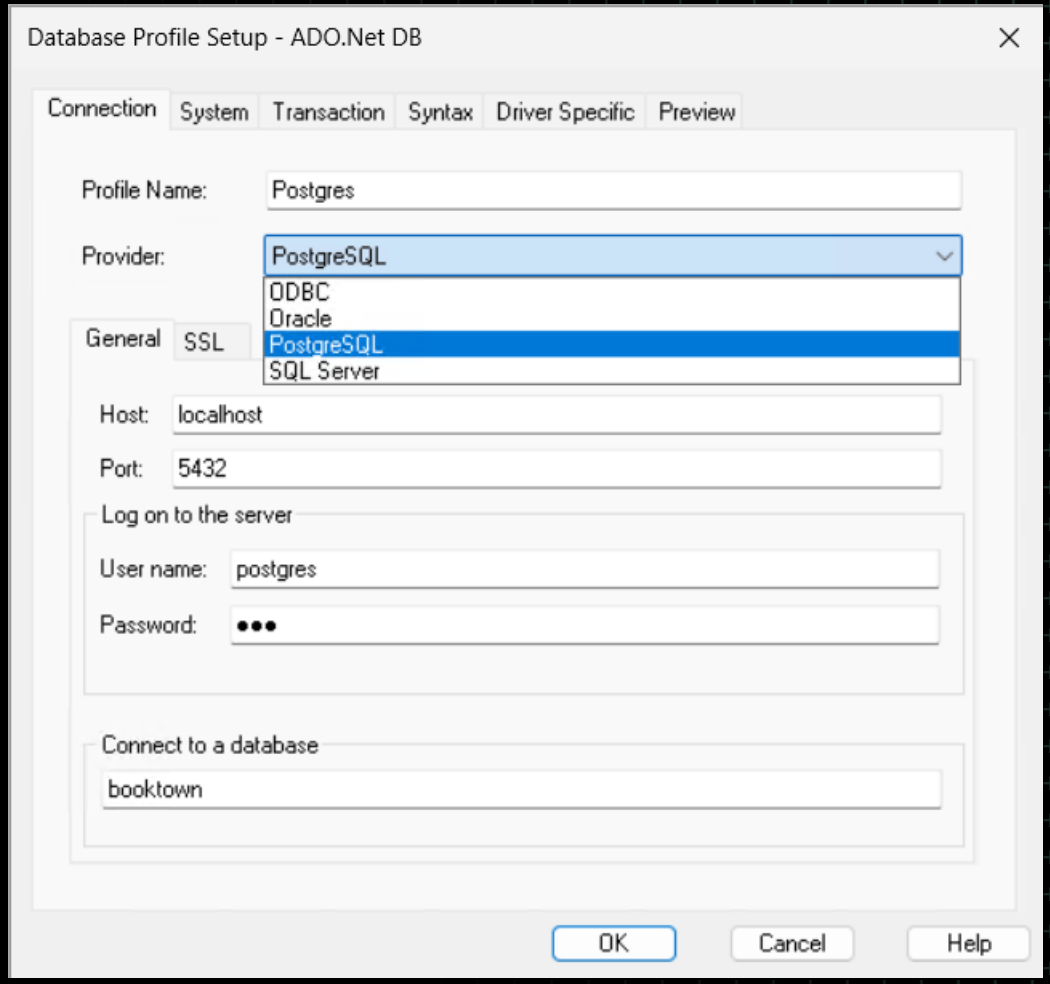
```
1   s_rect   ls_rect
2   string   ls_position, ls_x, ls_y
3   longptr  ll_x, ll_y
4
5   ls_position = of_convert_number_to_binary_string(wparam)
6   ls_x = Right ( ls_position, 16 )
7   ls_y = Left ( ls_position, 16 )
8
9   ll_x = of_convert_binary_string_to_number(ls_x)
10  ll_y = of_convert_binary_string_to_number(ls_y)
11
12  st_3.text = String ( ll_x ) + ' - ' + String ( ll_y )
13
14  ls_rect = of_pointer_to_rect(lparam)
15
16  st_4.text = String ( ls_rect.top ) + ' - ' + String ( ls_rect.bottom ) + " - " + String(ls_rect.left ) + " - " + String ( ls_rect.right )
17
18  this.resize ( Pixelstounits((ls_rect.right - ls_rect.left), XPixelsToUnits!),Pixelstounits(ls_rect.bottom - ls_rect.top,YPixelsToUnits!))
19
20  Return 1
```

DEMO:

Supporting high DPI

Connecting with PostgreSQL via ADO.NET driver

- PostgreSQL is now one of the options for Provider for an ADO.Net connection

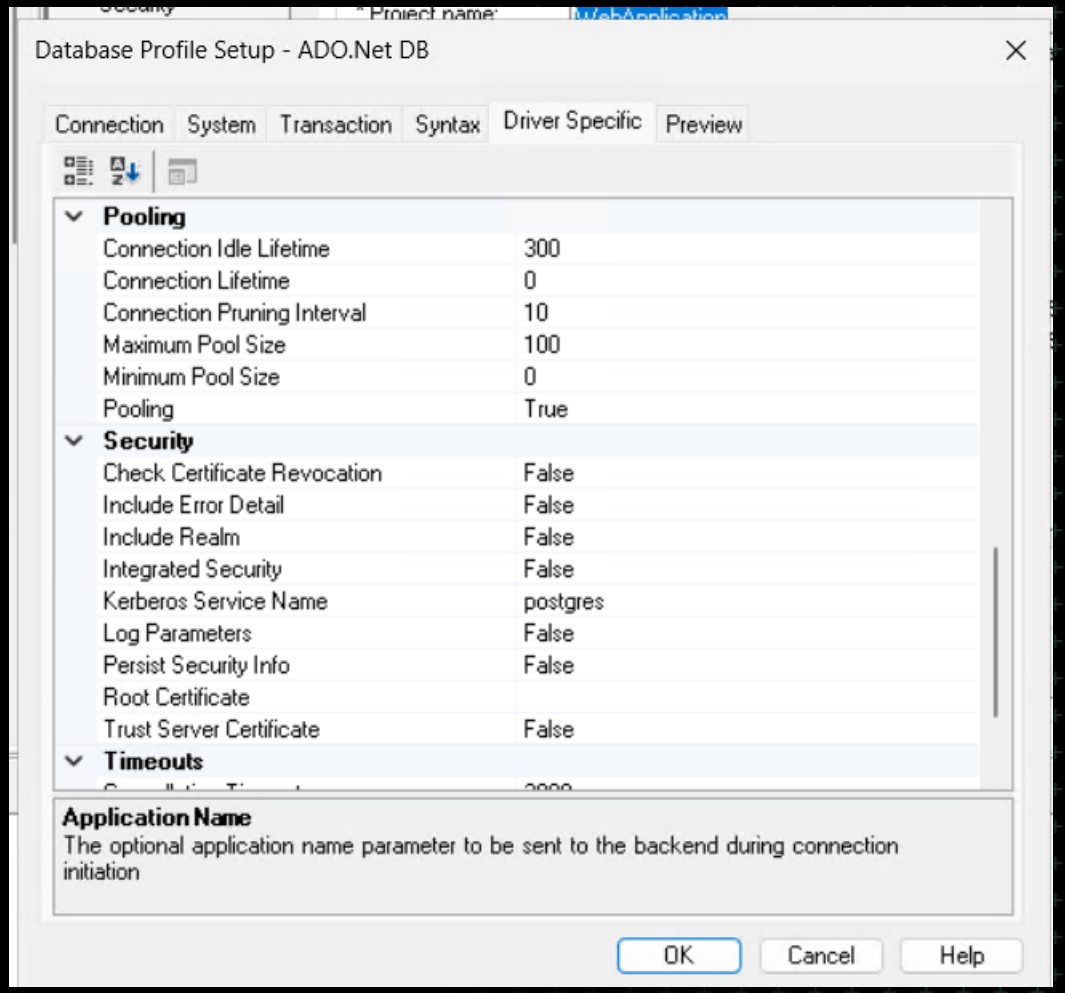


Connecting with PostgreSQL via ADO.NET driver

- Uses the open source Npgsql - .Net libraries
  - https://www.npgsql.org/
- The same libraries recommended by Microsoft for access PostgreSQL in Azure
  - https://learn.microsoft.com/en-us/dotnet/api/overview/azure/postgresql?view=azure-dotnet

Connecting with PostgreSQL via ADO.NET driver

- Using the ADO.Net driver provides access to features unsupported by the ODBC driver
  - Security and Encryption
  - Connection Pooling
  - Timeouts and Keepalive
  - Performance
  - Failover and load balancing



Connecting with PostgreSQL via ADO.NET driver

- The ADO.Net allows Appeon engineers to provide improved support for stored procedures and functions in future releases

DEMO:

Connecting with PostgreSQL via ADO.NET driver

Upgrading to .NET 8 and removing .NET Framework

- In 2025, features that used to work with .NET 6.0 have been upgraded to work with .NET 8.0
- The PowerBuilder Installer will install .NET 8 if it is not detected on your development machine
- The Excel 12 support that used to require .Net Framework 4.8 now uses .Net 8.0
- The following features still require .NET Framework 4.8
  - PowerBuilder Runtime Packager
  - DataWindow blob control

SMTPClient supports various authentication type

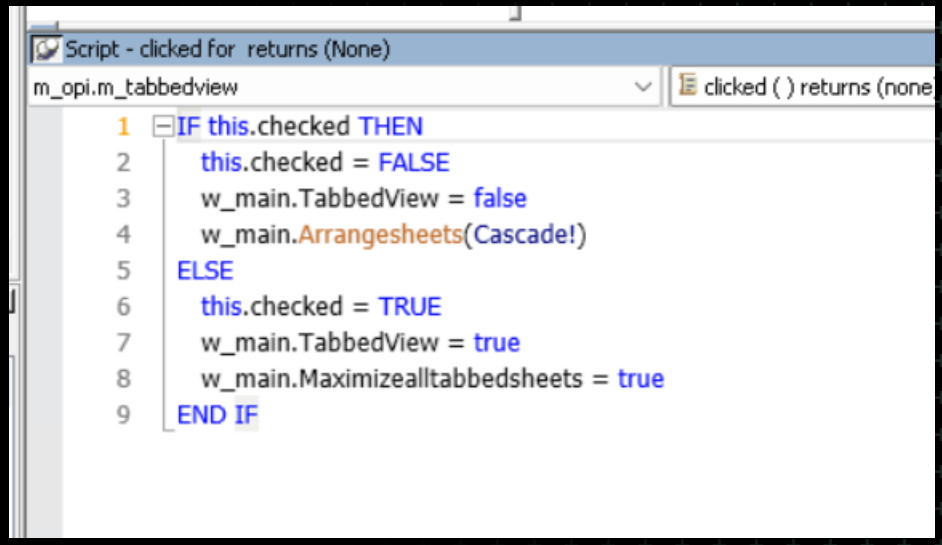
- GSSAPI
- LOGIN
- NTLM
- PLAIN
- XOAUTH2

Theme enhancement

- The background color of detail, summary, and footer bands for Crosstab and Grid DataWindows
  - "datawindow" > "cross-style" or "grid-style" > "detail-band" > "background-color"
  - "datawindow" > "cross-style" or "grid-style" > "summary-band" > "background-color"
  - "datawindow" > "cross-style" or "grid-style" > "footer-band" > "background-color"
- The background color of head, detail, summary, and footer bands for Freeform, Group, N-Up, Tabular, and TreeView DataWindows
  - "datawindow" > "tabular-style" (Freeform, Group, N-Up, and Tabular DataWindows all use the same node "tabular-style").
  - "datawindow" > "treeview-style" (For TreeView DataWindows)
- The border color of DropDownDataWindow
  - "datawindow" > "dropdown-type" > "normal-state" and "hover-state" > "border-color"

TabbedView enhancement

- TabbedView can now be enabled and disabled at runtime



DEMO:

TabbedView enhancement

DataWindow enhancements

- DataWindow Update Properties
  - The settings in the Specify Update Properties window will no longer be removed if you change an updatable table via DataWindow SQLs. If you change a table via SQLs which causes the update properties to change (such as adding, deleting, or modifying a column), the settings in the associated Specify Update Properties window will be retained and the column changes (as well as the key column changes, table name changes, if any) will also be reflected in the window.
- DataWindow SaveAs
  - Saves the values of the columns as they are displayed in the format specified.

DEMO:

DataWindow enhancements

Source control enhancements

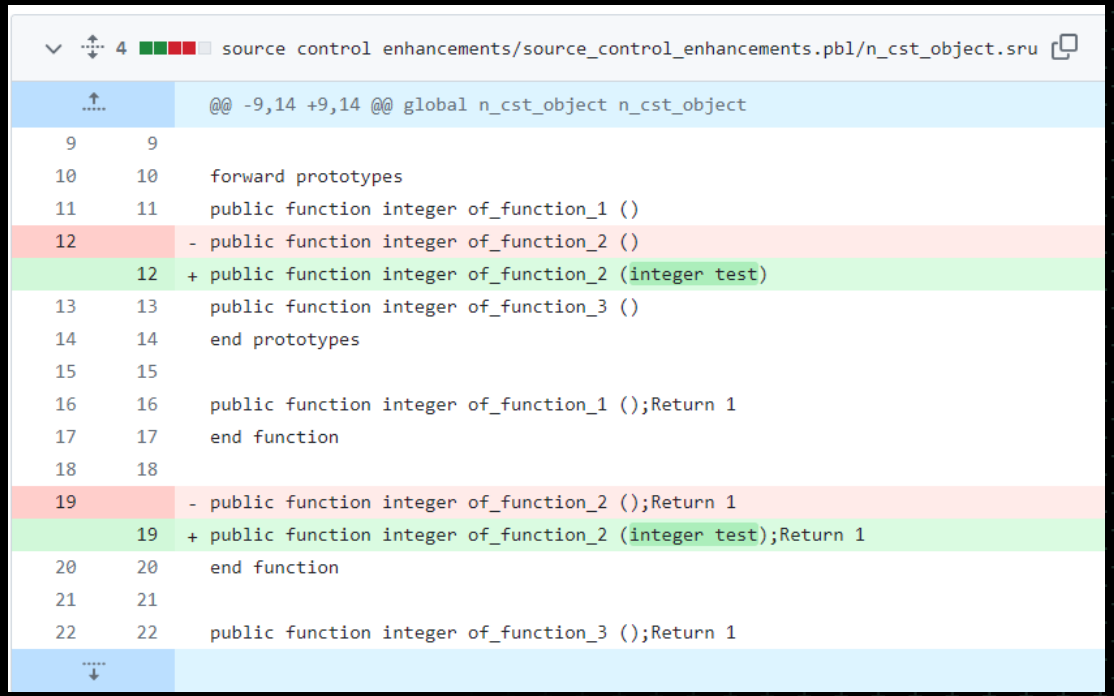
- In versions prior to PowerBuilder 2025, revising a method signature caused the IDE to reorder the function definitions
- This cause spurious merge conflicts

8 ws_objects/source_control_2022/source_control_2022.pbl.src/n_cst_object.sru

```
@@ -9,20 +9,20 @@ end type
9  9   global n_cst_object n_cst_object
10 10
11 11  forward prototypes
12    - public function integer of_function_1 ()
13 12  public function integer of_function_2 ()
14 13  public function integer of_function_3 ()
   14 + public function integer of_function_1 (integer test)
15 15  end prototypes
16 16
17    - public function integer of_function_1 ();Return 1
18    - end function
19    -
20 17  public function integer of_function_2 ();Return 1
21 18  end function
22 19
23 20  public function integer of_function_3 ();Return 1
24 21  end function
25 22
   23 + public function integer of_function_1 (integer test);Return 1
   24 + end function
   25 +
26 26  on n_cst_object.create
27 27  call super::create
28 28  TriggerEvent( this, "constructor" )
```

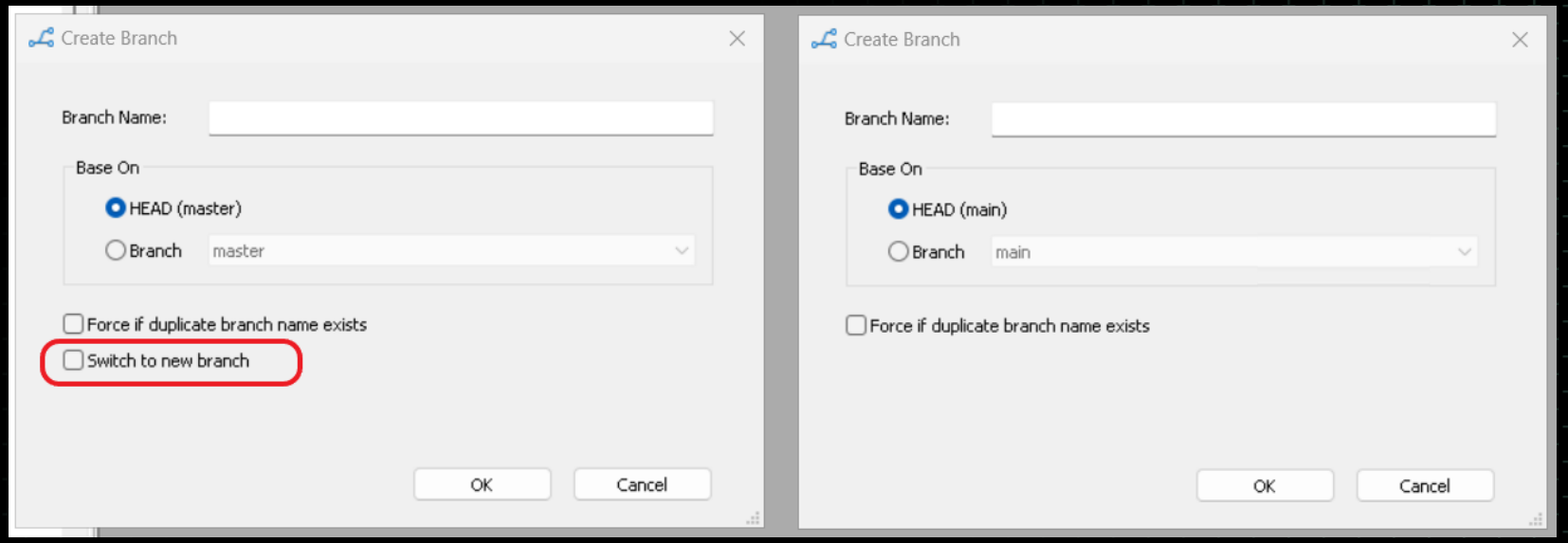
Source control enhancements

- In PowerBuilder 2025, the change no longer reorders the code, resulting in fewer merge conflicts



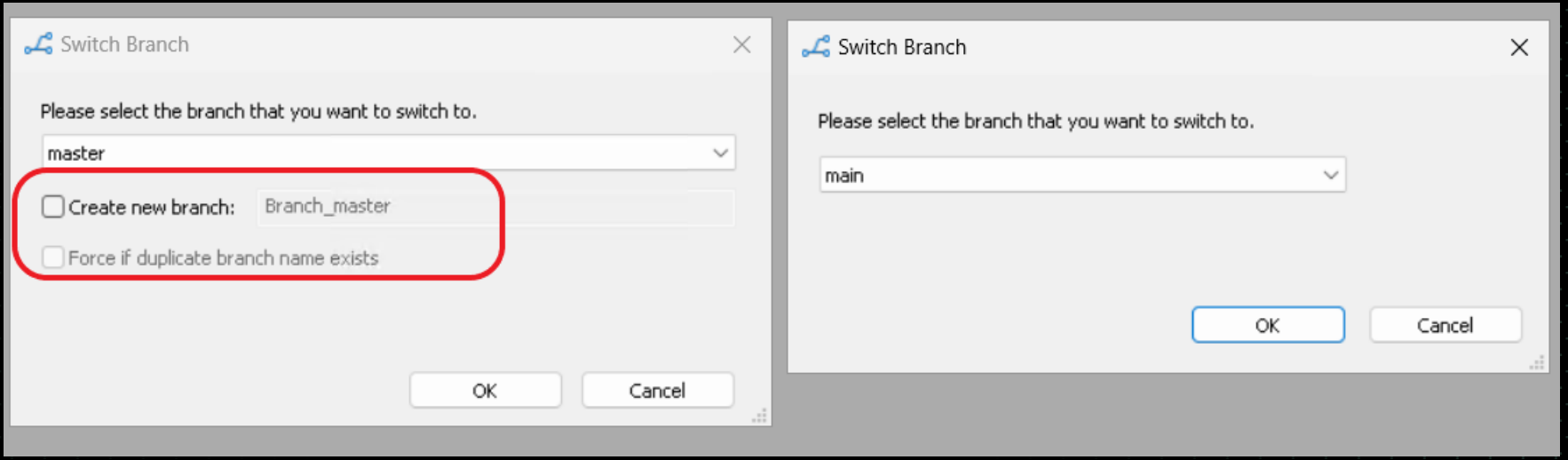
Source control enhancements

- Create New Branch enhancement
  - Allows us to automatically switch to the newly created branch



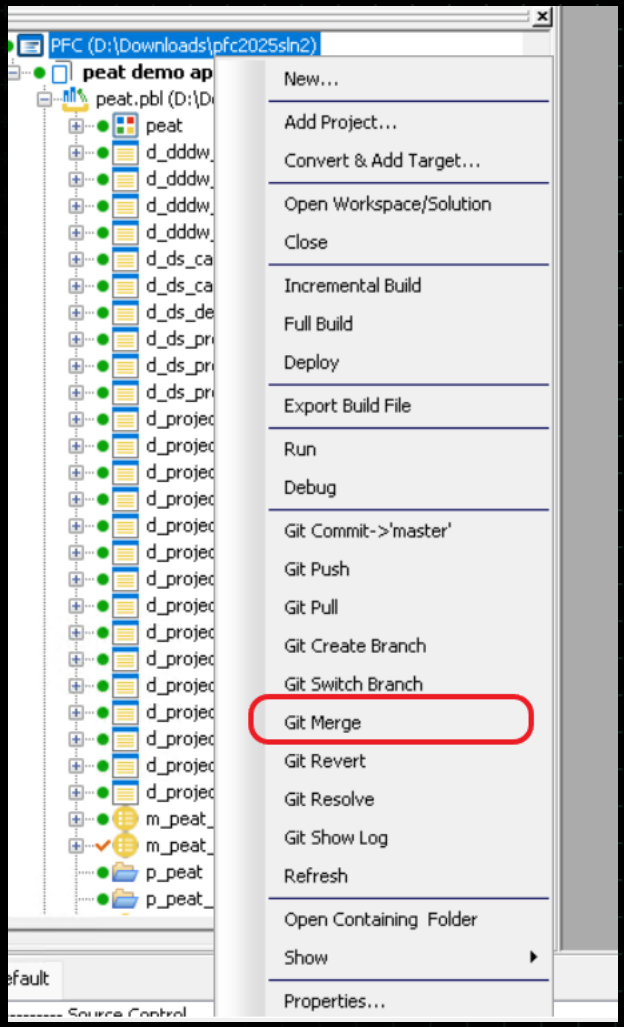
Source control enhancements

- Switch Branch enhancements
  - Now we can create the new branch on the fly and switch to it in one operation



Source control enhancements

- New Merge option



DEMO:

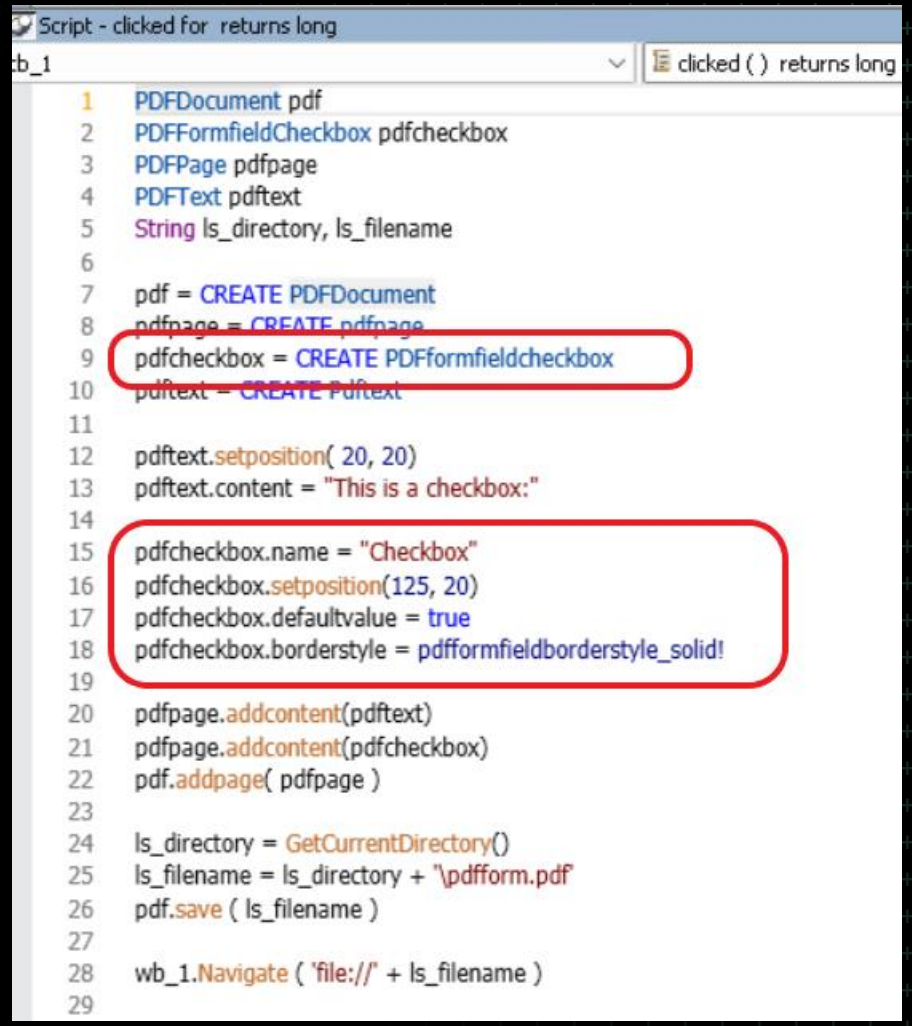
Source control enhancements

PDF Builder enhancements

- Creating Form objects
- Importing PDF Blob to PDF document

Creating Form objects

- New PDFFormField objects
  - PDFFormFieldCheckbox
  - PDFFormFieldCombobox
  - PDFFormFieldListBox
  - PDFFormFieldPushButton
  - PDFFormFieldRadioButton
  - PDFFormFieldText

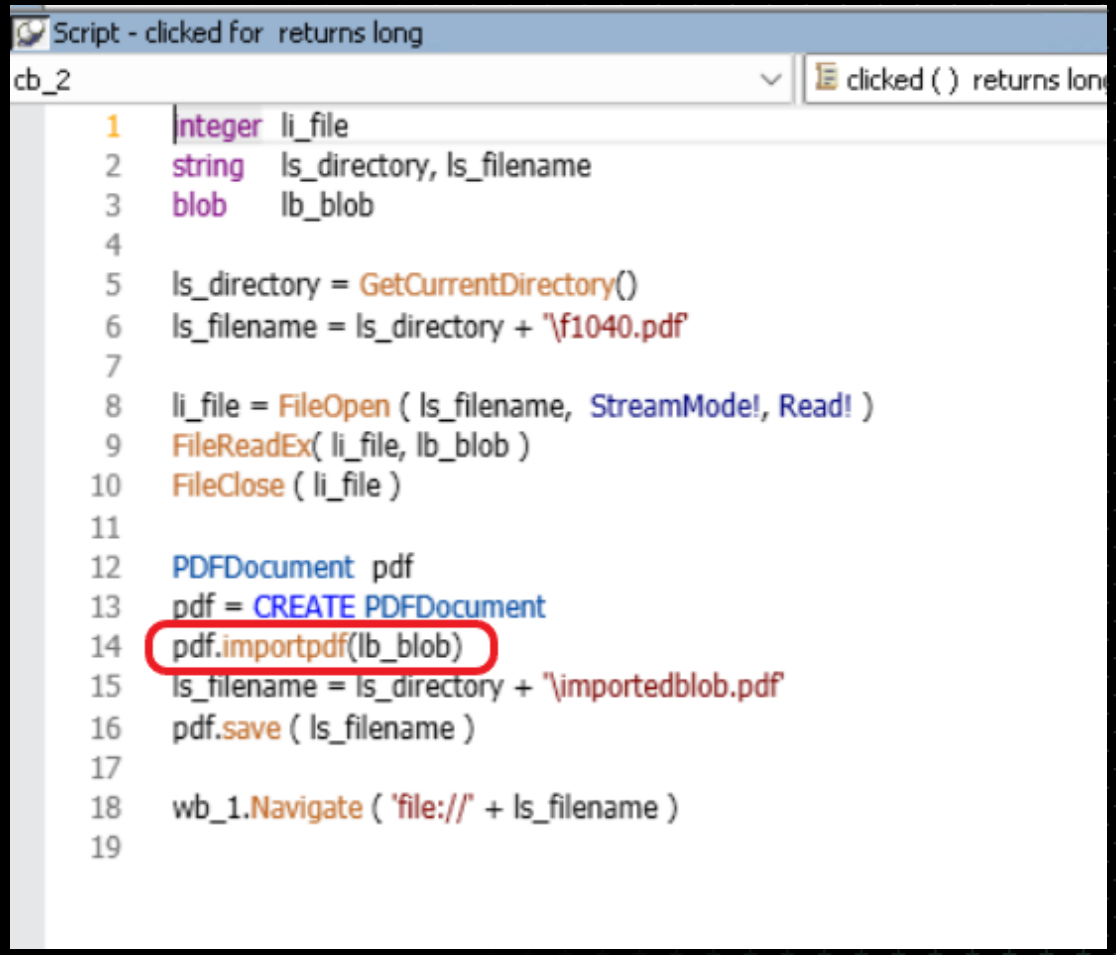


Creating Form objects

- Controls can be groups within a PDFFormFieldGroup
- PDFFormFieldPushButton can be associated with PDFActions
  - PDFActionJavaScript (run a JavaScript script)
  - PDFActionNamed (trigger a PDF viewer menu item)
  - PDFActionResetForm (reset a PDF form)

Importing PDF Blob to PDF document

- PDFs stored as blobs can be imported into PDFDocument and manipulated
  - This is a trivial sample in that we're just reading a file into a blob.
  - In practice you might be retrieving the blob from a database or from a web service

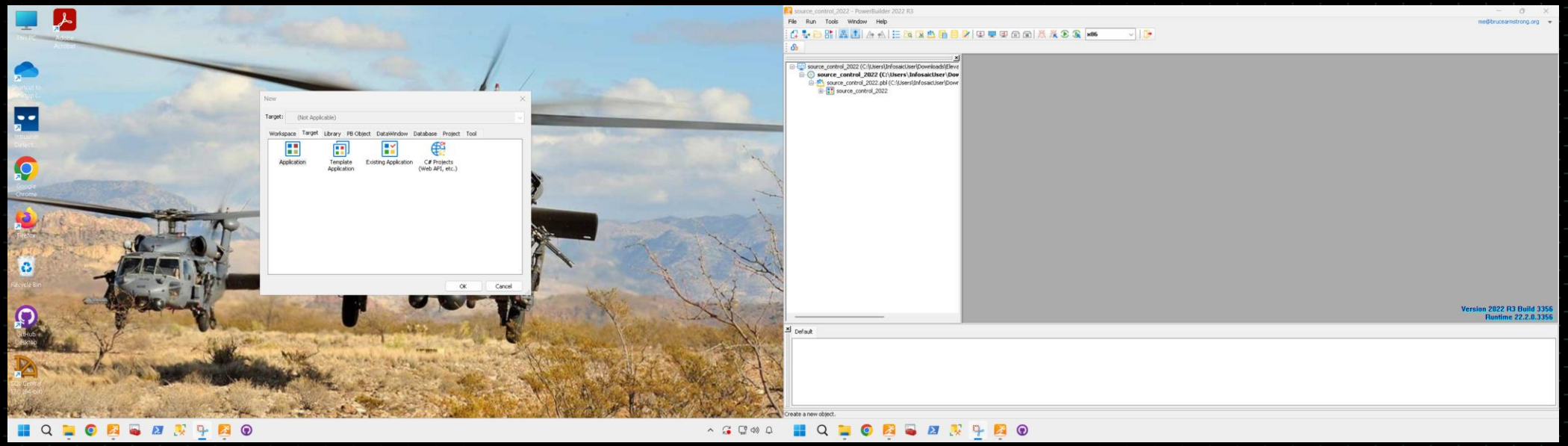


DEMO:

PDF Builder enhancements

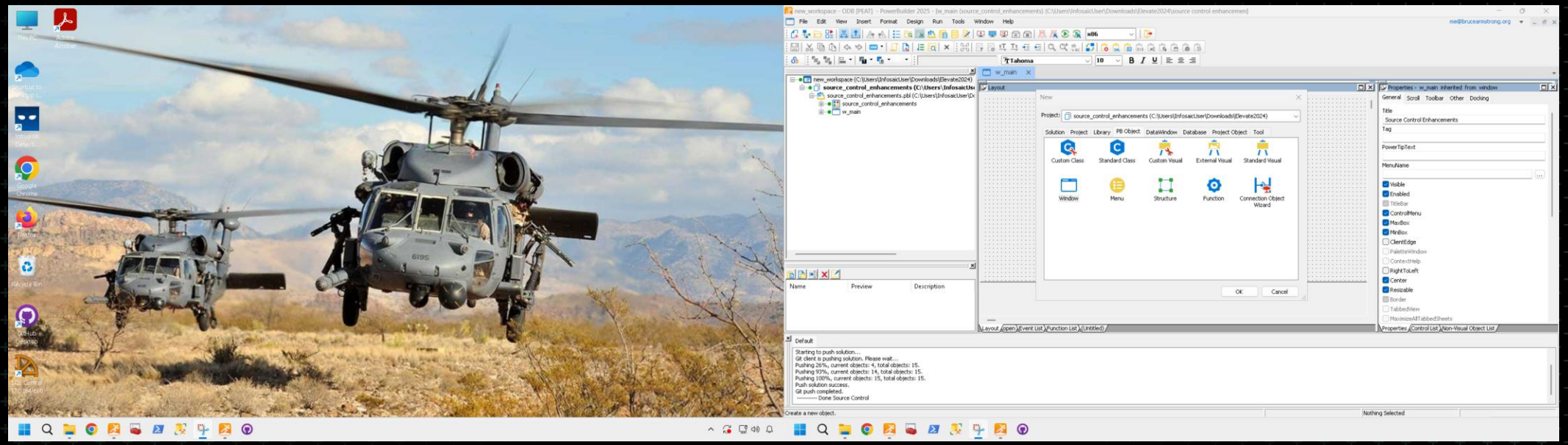
Supporting multiple display monitors

- 2022 – Dialogs appear on primary monitor although IDE is running in secondary



Supporting multiple display monitors

- 2025 – Dialogs appear on same monitor as IDE is running in



Supporting multiple display monitors

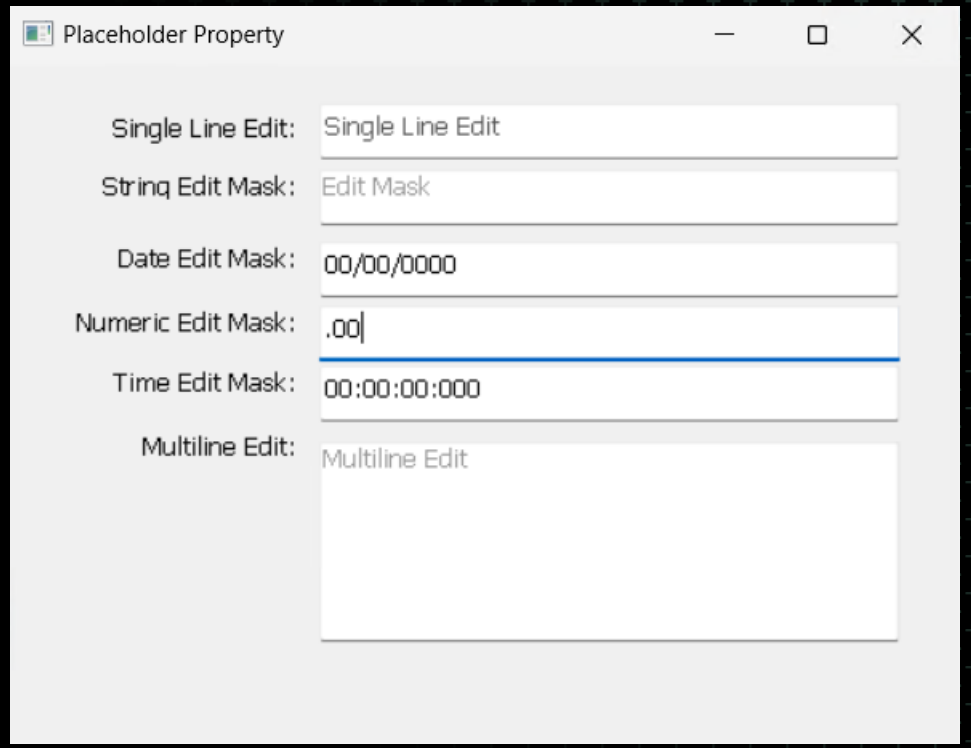
- The PowerBuilder IDE main window remembers which monitor it was open on last and will reopen on that monitor.
- Compiled PowerBuilder applications remember which monitor it was opened on last and will reopen on that monitor.
- The Environment objects has two new properties:
  - ScreenX – X coordinate of the current screen in pixels
  - ScreenY – Y coordinate of the current screen in pixels

DEMO:

Supporting multiple display monitors

Placeholder property for EditMask and MultiLineEdit

- Placeholder now works for Edit Mask (String only) and Multiline edit controls



DEMO:

Supporting Placeholder property for EditMask and MultiLineEdit

Installer changes

- Only versions that have not reach their end of support (EOMM) are available in the installer (2019 R3, 2022, 2022 R2 and 2022 R3, and 2025).
- There will be a dedicated page on the Appeon web site Download center for providing the offline installer links for versions that have reached EOMM.
- The Installer UI has been updated
  - SnapDevelop is not longer listed (it has its own separate installer now)
  - Provides .NET DataStore parallel to the other PowerBuilder programs
  - PowerScript Migrator is no longer listed (discontinued feature)

Discontinued/Obsolete Features

- Discontinued – Completely removed from product
  - PowerScript Migrator
- Obsolete – Still available in product, but are no longer supported or enhanced and may be discontinued in a later release
  - MSSCCI interface for source code control
  - .NET 6.0

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Q&A Time