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PowerBuilder .NET Compiler: In-Depth Review

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PowerBuilder .NET Compiler: In-Depth Review



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Agenda

- Breaking news!
 - PowerBuilder .NET support
 - ASP .NET 2.0 and Visual Studio release dates
- Overview of the PowerBuilder .NET Compiler

PowerBuilder .NET Compiler





Microsoft's Modified Release Schedule

- PowerBuilder's .NET Compiler
 - Takes advantage of ASP .NET 2.0 features
 - Originally slated for PowerBuilder 11 release Q4 2005
- Visual Studio .NET 2005 (ASP .NET 2.0)
 - Release date moved by Microsoft from Summer 2005 to Q4 2005

PowerBuilder 10.5

- DataWindow Enhancements
 - TreeView Presentation Style
 - Auto-size Height for All DataWindow Bands
- UI Enhancements
 - DateTime Picker
 - Menus and Toolbars
 - New Icons and Bitmaps
- DB Services Enhancements
 - Oracle 10g
 - Native driver for ASE 15.0
- Web Services Enhancements
 - Support More Data Types via AXIS Parser

PowerBuilder Application Server Plugin

- Deploy PB NVOs directly to 3rd Party Application Servers

PowerBuilder 11.0

- .NET Compiler
 - ASP .NET 2.0 Support
 - Smart Client Support
- .NET Integration

Q1
2006

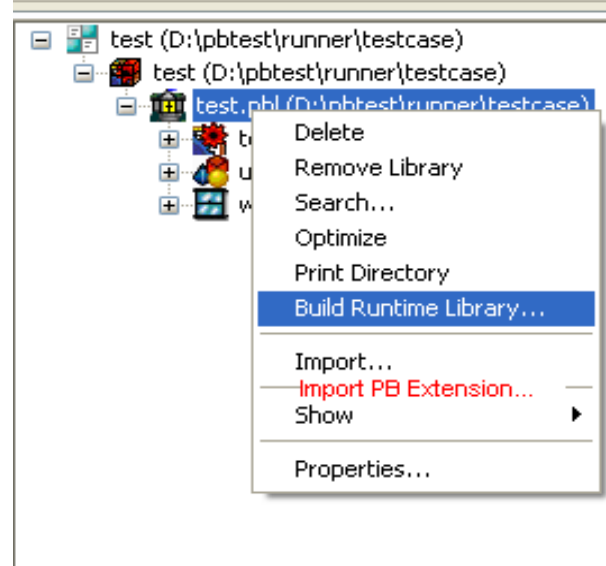
Q2
2006

Q3
2006

Q4
2006

PowerBuilder 10.5 Enhancements

- PBNI Extension Support
 - Direct import of PBNI classes versus attaching to Library List
 - **Creation of PBD wrapper no longer required**
 - **Easier for SCC and migration**



PowerBuilder 10.5 Enhancements

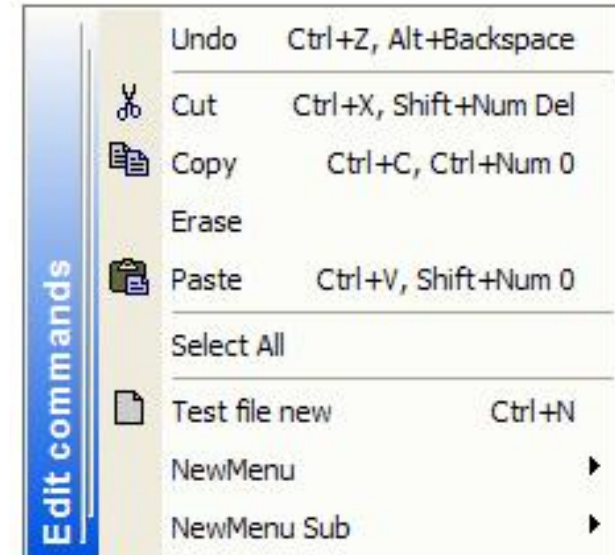
- Decimal type upgrade
 - Provide support for 30 digits versus current 18
 - Position for support of .NET which handles 28 digits
 - DataWindow expression support
 - **Currently all numerics converted to double before calculations**
 - **Add Decimal() DataWindow function for conversion**

PowerBuilder 10.5 Enhancements

- DateTime picker
 - Wrapper for Microsoft Common Control
 - New control and/or enhancement to EditMask
 - New DataWindow edit mask style



- Menu Enhancements
 - Styles
 - **Contemporary**
 - **3D**
 - **Traditional**
 - Style attributes
 - **Shadow**
 - **Bitmaps (16x16 and 32x32)**
 - **Titles**
 - **Main background color**
 - **Bitmap background color**
 - **Highlight color**
 - Relies on GDI+ (GDIPLUS.DLL)



PowerBuilder 10.5 Enhancements

- **Toolbar Enhancements**
 - **Styles**
 - **Rebar style (below)**
 - **Contemporary**
 - **Traditional**
 - **3D**
 - **Style attributes**
 - **Collapsible**
 - **Gripper style**
 - **Highlight color**
 - **Background color**
 - Allow toolbars to be attached to top-level non-MDI Windows
 - Relies on GDI+ (GDIPLUS.DLL)



PowerBuilder 10.5 Enhancements

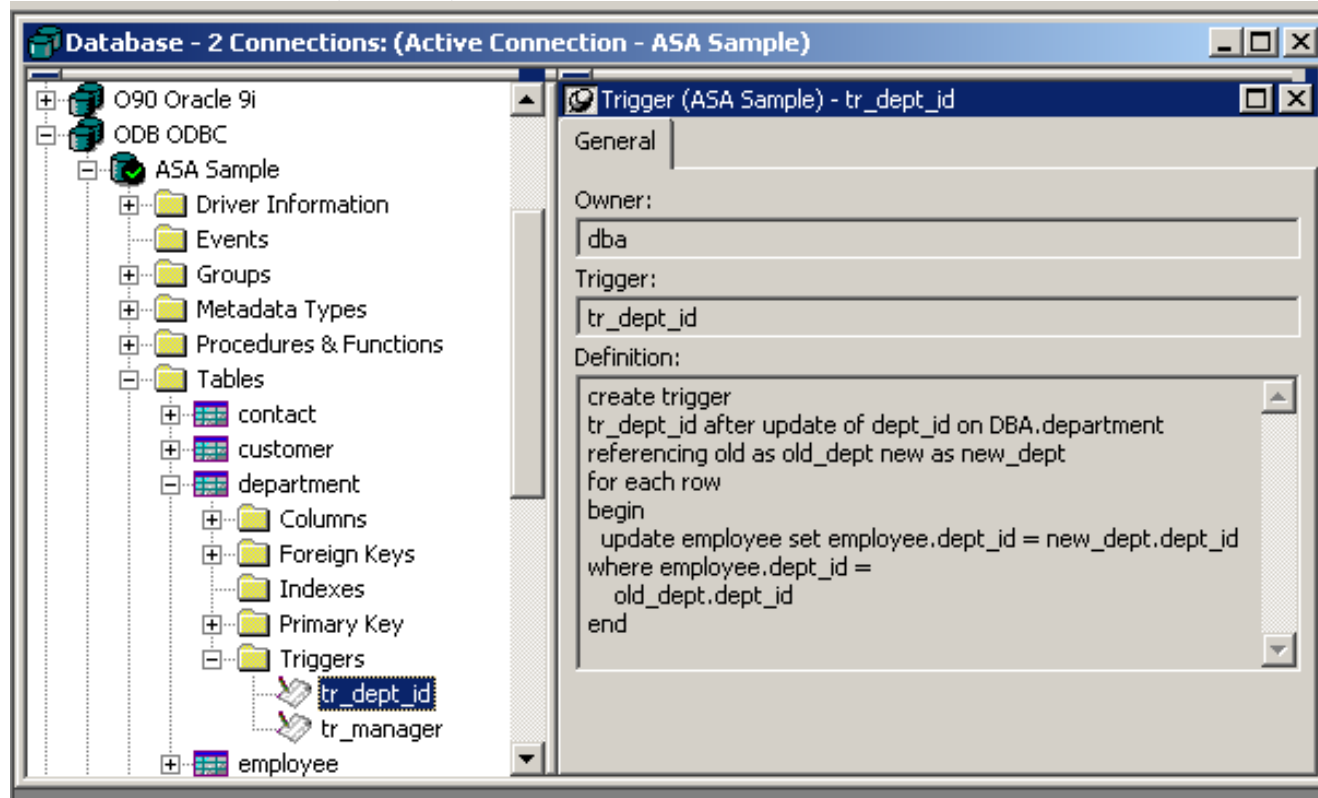
- New Rich Text Edit control
 - PB10 investigation of Microsoft control found it lacking in features necessary to support DataWindow
 - TX Text Control (still not finalized)
 - <http://www.textcontrol.com/>
 - **Minimal (if any) loss of current functionality**
 - **New functionality including saving as Microsoft Word DOC format**
- Updated bitmaps and icons
 - Provide updated look to IDE
 - Allow use in application
 - Potential sources
 - **3rd party**
 - **Reuse from Sybase Workspace**

PowerBuilder 10.5 Enhancements

- Oracle 10g driver
 - Support for binary_float and binary_double types
 - Enhanced support for BLOB and CLOB types
 - Oracle Instant Client support
- ADO.NET Enhancements
 - Support for System.Data.SqlClient (Microsoft SQLServer) including Connection and Command timeout
- Alternative tracing DLL (PBTRSnnn.DLL)
 - SQLCA.DBMS = "TRS ODB"
 - Prompted by large PowerBuilder client with Sarbanes-Oxley auditing requirements
 - Logs connection handle, DBI command, date and time of request (server or client) and SQL

PowerBuilder 10.5 Enhancements

- Triggers and Events in Database Painter
 - Event support for ASA and ASE only
 - Trigger support planned for all database interfaces
 - Display only

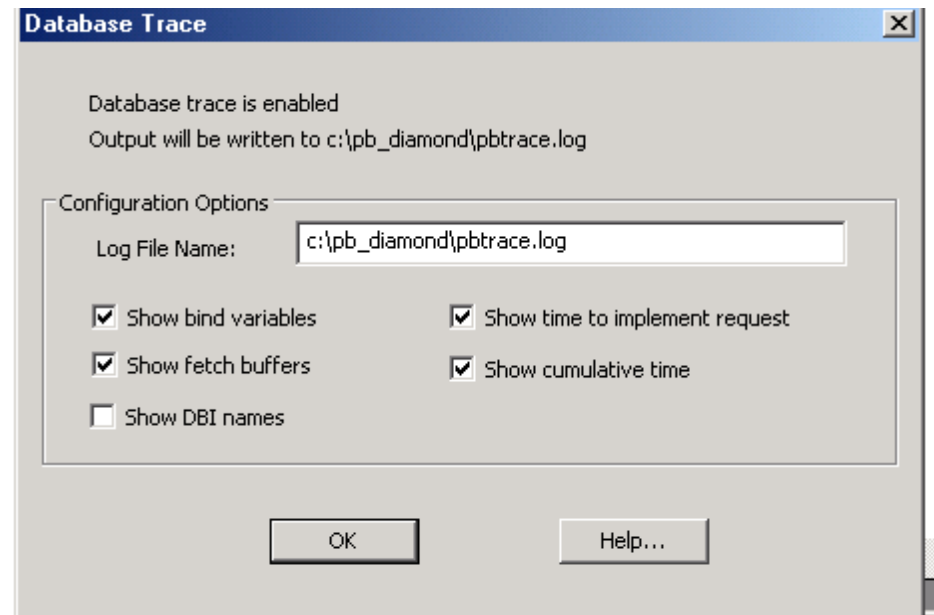


- Database tracing enhancements
 - Undocumented INI settings available in dialog (right) and stored in registry
 - Timing granularity improved to 1 microsecond
 - Record statement and cumulative time
 - Programmatically start and stop trace

```
SQLCA.DBParm="PBTrace=1"
```

```
dw.Update()
```

```
SQLCA.DBParm="PBTrace=0"
```



PowerBuilder 10.5 Enhancements

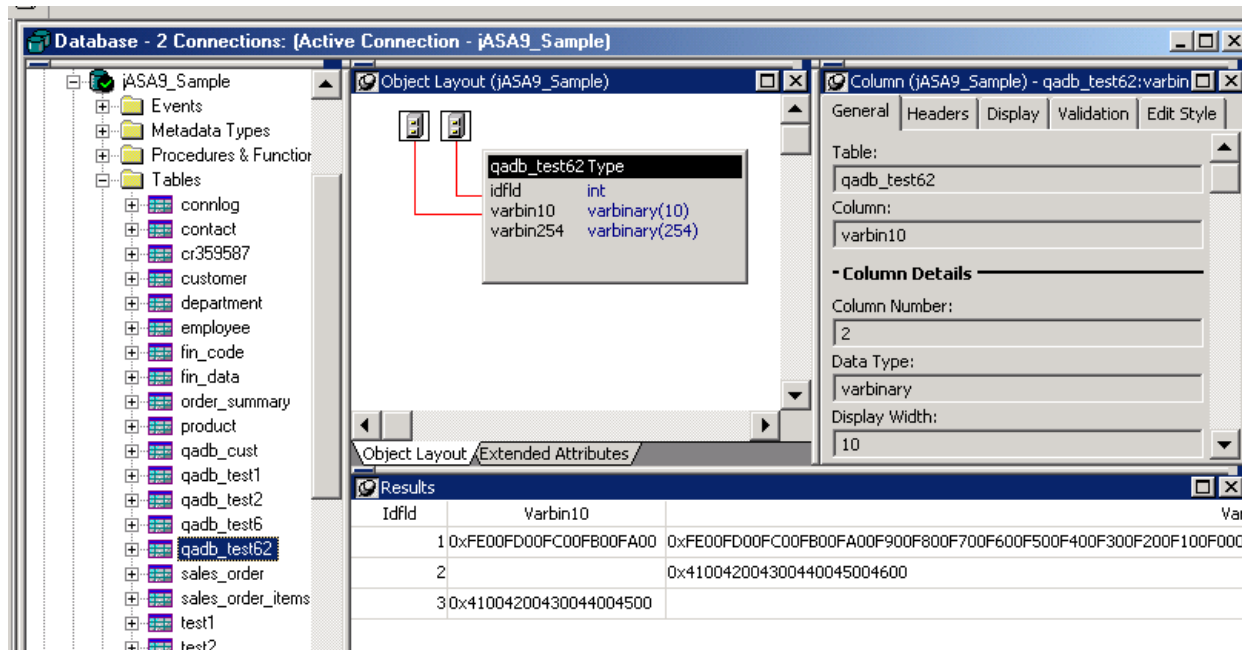
- Infrastructure refactoring (continuing past PB 11)
 - DataWindow “rewrite” to support growth

Processing Styles	Crosstab	Graph	Grid	Label	Nested	Ole	RichText
Functions	Load / Save	Parse / Generate / Info	Describe / Modify	Expression	Table	Import	Export
	Painting / Printing	Control	Edit Style	Event	Function	Dialog	External

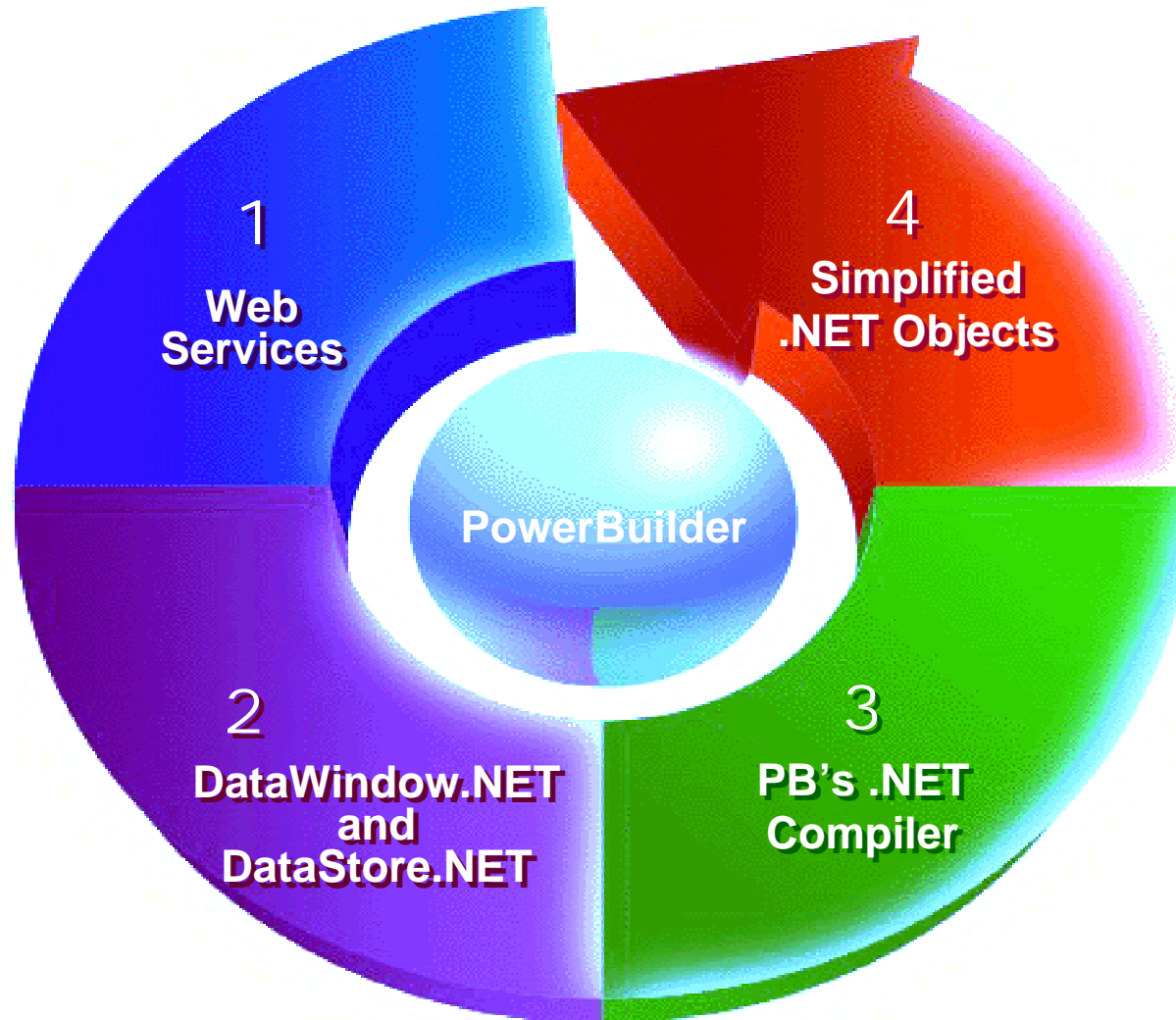
- Development of generic Data Source Interface (DSI)
 - **Abstract layer above current DBI layer**
 - **Designed to support access of non-SQL based data**
 - .NET DataSet
 - EJB
 - Web Services

PowerBuilder 10.5 Enhancements

- SELECT support for binary and image data
 - Data formatted as hexadecimal string
 - **DataWindow support without need for OLE-Blob column**
 - **Embedded SQL support**
 - Updateable depending on type and database support



PowerBuilder's Place in .NET

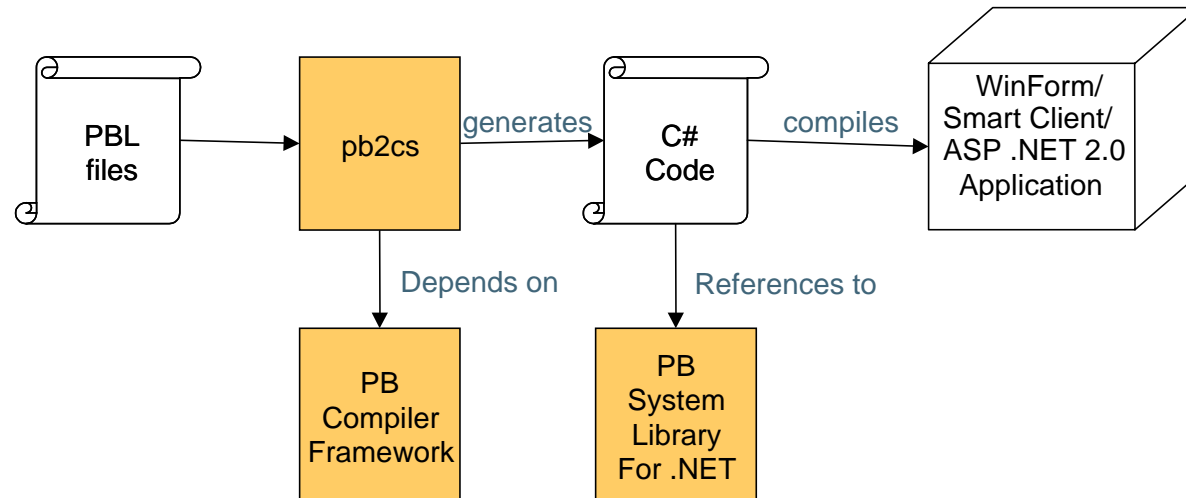


PowerBuilder .NET Support

- .NET Integration
 - Goals
 - **Build .NET classes**
 - **Consume .NET classes**
 - **Inherit from .NET classes / implement .NET interfaces**
 - To meet all goals for long term growth of PowerBuilder, a PowerBuilder to .NET (MSIL) compiler is being built
 - Phased approach
 - **PowerBuilder -> .NET deployment (PB11)**
 - **PowerBuilder -> .NET Service Consumption (PB12)**

PowerBuilder .NET Integration

- .NET Integration
 - Compiler steps – relies on redistributing C# compiler from Visual Studio .NET



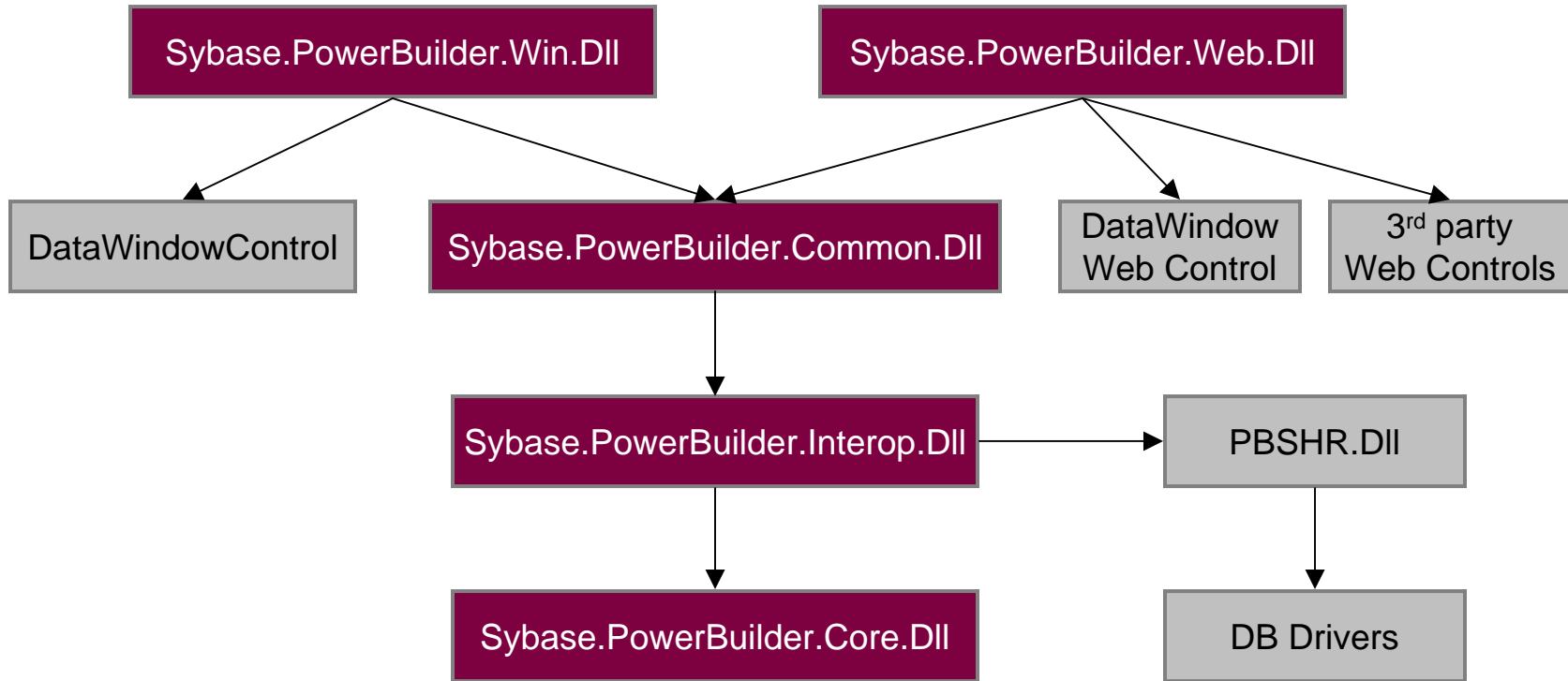
PB System Library for .NET

- System classes and system functions
- Managed PBVM
- Relies on DataWindow.NET, PBSHR.DLL, and DB drivers

System-Defined Visual Classes

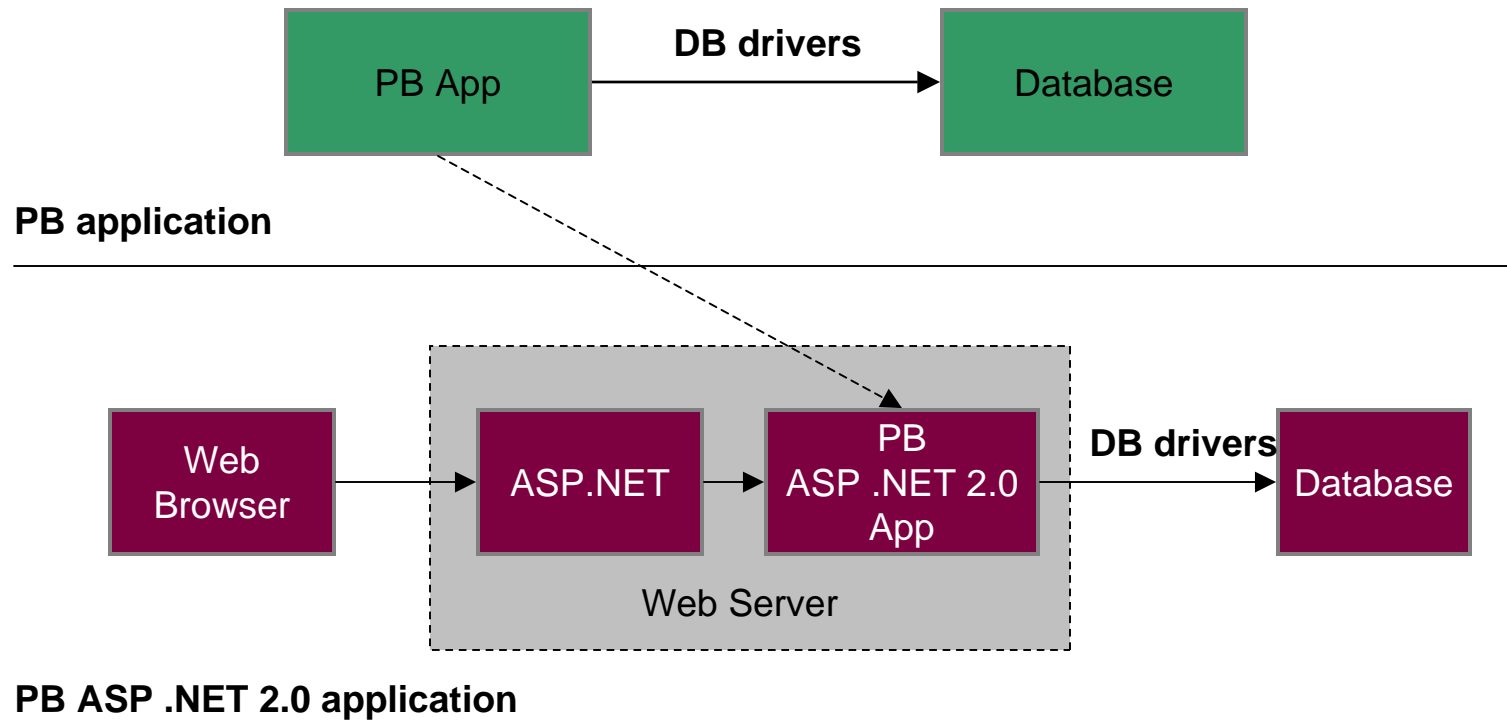
- Visual classes for WinForm
- Visual classes for ASP .NET 2.0

Assemblies of PB System Library for .NET



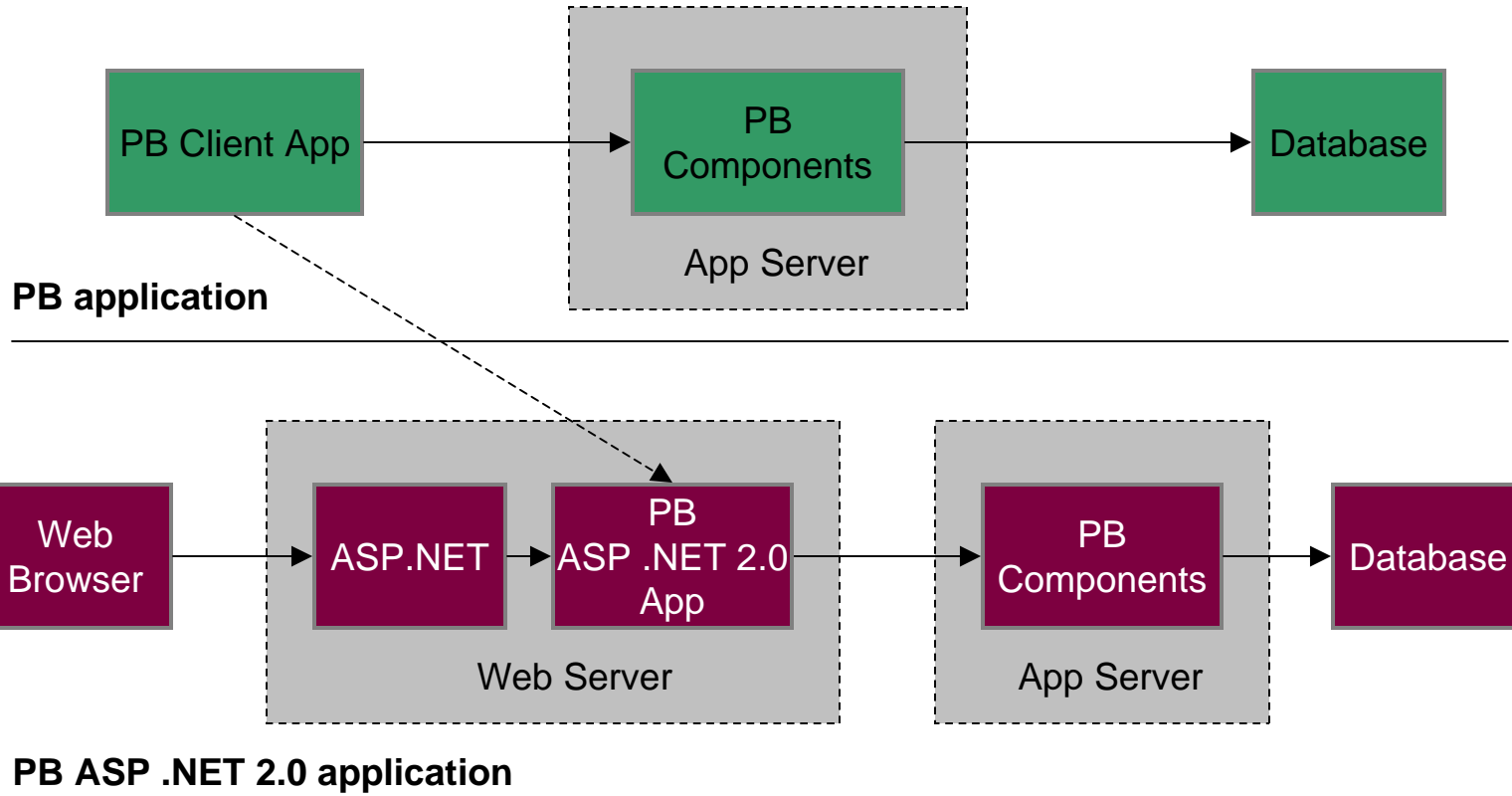
Deploying to ASP.NET

- PB ASP .NET 2.0 Architecture (2-tier applications)



Deploying to ASP.NET

- PB ASP .NET 2.0 Architecture (3-tier applications)



Mapping PB Features to .NET

- PB Features
 - Data types (including nullness of variables)
 - Arrays
 - System classes and system enumerations
 - Event handling
 - Method invocation (dynamic/post)
 - Operators and expressions
 - Statements
 - Embedded SQL
 - DataWindow (dot notation)
 - External functions
 - COM
 - EAServer integration
 - PBNI

PB Data Types

- Standard types: blob, boolean, char, date, datetime, decimal, double, int, long, real, string, time, uint, ulong, and longlong
- Any
- Cursor and procedure

PB data type	.NET struct counterpart	.NET data type used
any	PBAny	object
blob	PBBlob	byte[]
boolean	PBBoolean	bool
char	PBChar	char
date	PBDate	DateTime
datetime	PBDateTime	DateTime
decimal	PBDecimal	decimal
double	PBDouble	double
int	PBInt	Int16
long	PBLong	Int32
real	PBReal	float
string	PBString	string
time	PBTime	DateTime
uint	PBUInt	UInt16
ulong	PBULong	UInt32
longlong	PBLongLong	Int64

System-Defined Enumerations

- Enum names prefixed with “PB”
- Using Pascal naming convention for enum items

Powerscript:

```
system type BorderStyle enumerated
  StyleBox! = 2
  StyleRaised! = 6
  StyleLowered! = 5
  StyleShadowBox! = 1
end type
```

C#:

```
enum PBBorderStyle {
  StyleBox = 2,
  StyleRaised = 6,
  StyleLowered = 5,
  StyleShadowBox = 1
}
```

- Class names prefixed with “PB”
- Using Pascal naming convention for member functions and instance variables

PowerScript:

```
system type Throwable from NonVisualObject
  string Text
end type
function string getMessage()
  return text
end function
subroutine setMessage(String msg)
  text = msg
end subroutine
```

C#:

```
class PBThrowable : PBNonVisualObject {
  public PBString Text;
  public PBString GetMessage() {
    return Text;
  }
  public SetMessage(PBString msg) {
    Text = msg;
  }
}
```

Event Handling

- PB events → .NET events
- PB event IDs → .NET delegates
- PB event handler → .NET function that is registered to a .NET event

- WinForm Support
 - Implemented using .NET Windows Forms controls
 - No classic PBVM involved
 - Make use of DataWindow.NET (supports dot notation)
 - Deploy Smart Client applications

PB.NET Support

- .NET Web Services
 - Generate .asmx file for PB NVOs
- ASP .NET 2.0 Compiler
 - Empowers the Developer to create new ASP .NET web applications using only the PowerBuilder IDE
 - Rich Internet application
 - Implemented on top of ASP.NET
 - Supporting most features of PowerBuilder

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