ELEVATE 2017

Appeon Web for Beginners

MEONI Marco
September 25, 2017

Agenda

- Appeon (Web) Introduction
- Appeon Toolkit
- Hands On
    - HelloWorld
    - DB connection and DWs
- AEM
- Performance Tuning
- Middle Tier Interface

Author Profile

Marco MEONI

in linkedin.com/in/meonimarco

twitter.com/marcomeoni

Key Skills

- PowerBuilder
- Hadoop
- Appeon
- Machine Learning

Recent Projects

- **2013** - Dutch Ministry of Tax: migration to Appeon Web of 3GB of PB code
- **2016** - Cloud-based Appeon Web portal for Healthcare systems
- **2017** - Predictive Models for dataset caching on CERN Big Data

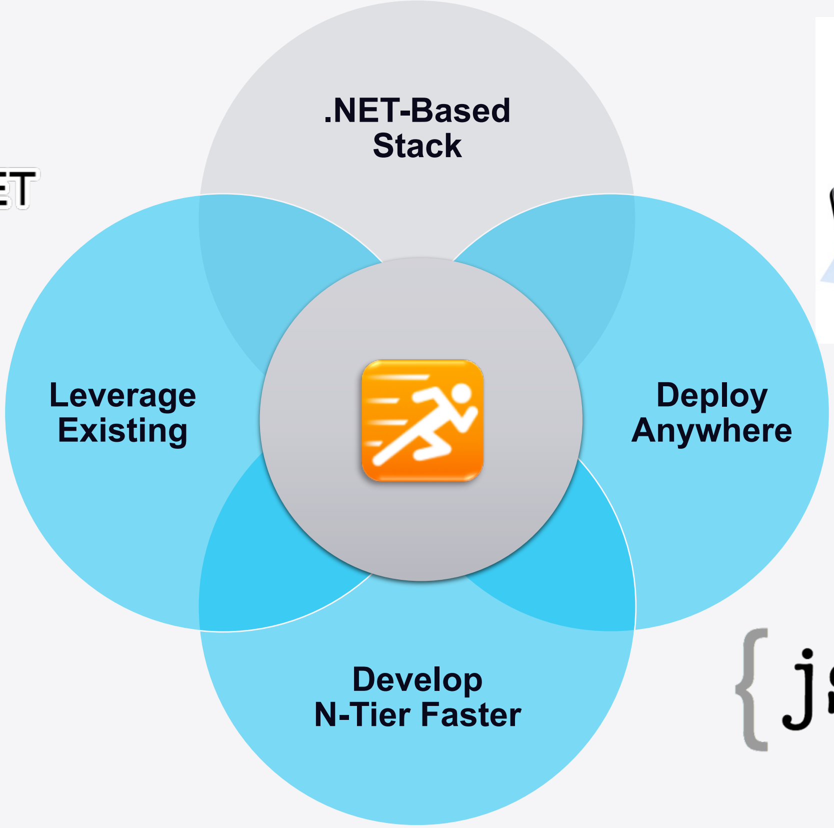
Introduction

Hands-on Prerequisitities

- Install Powerbuilder 2017
- Remove Powerserver Mobile 2017
- Install Appeon Web 2016 TE
  - (available on USB stick)

Powerbuilder 2017

Microsoft .NET



.NET-Based Stack

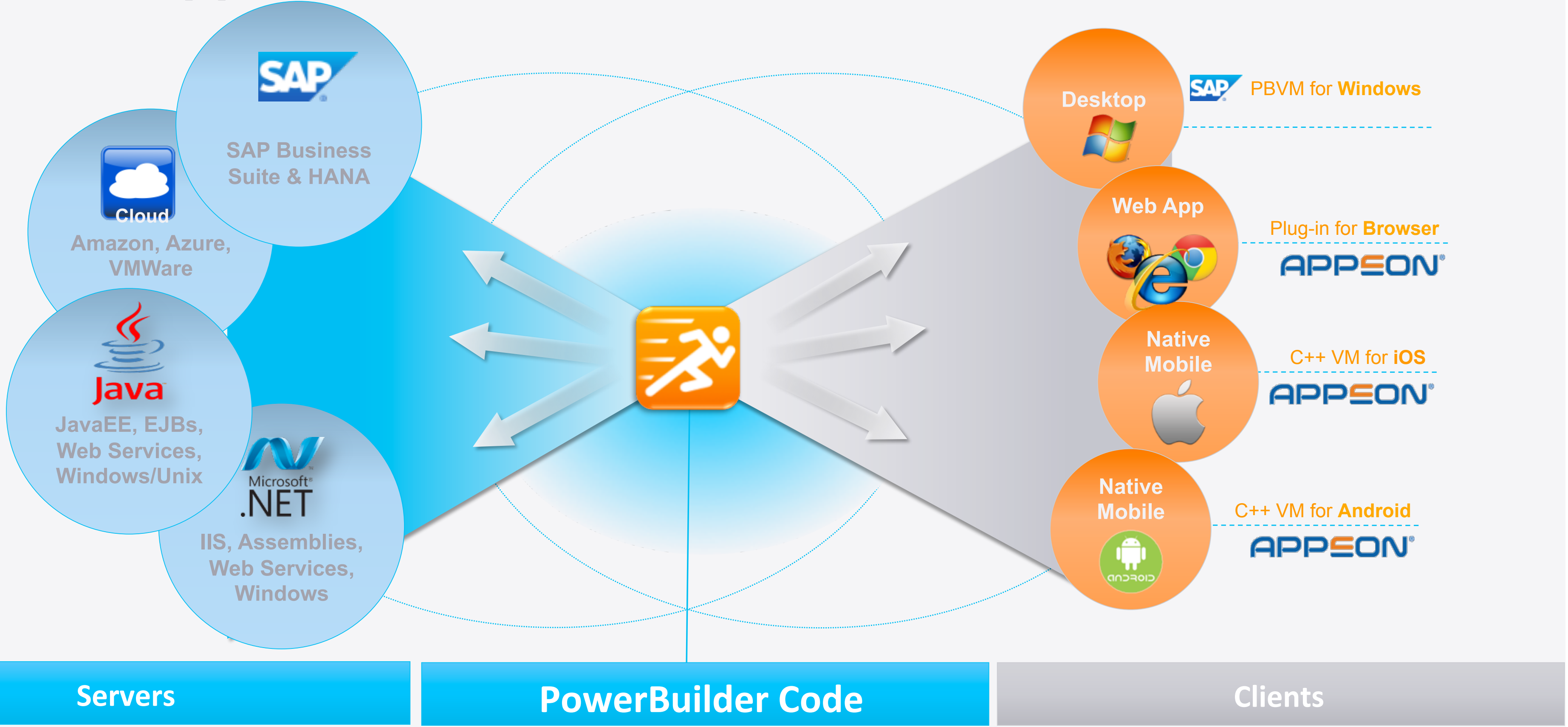
Leverage Existing

Deploy Anywhere

Develop N-Tier Faster

{json:api}

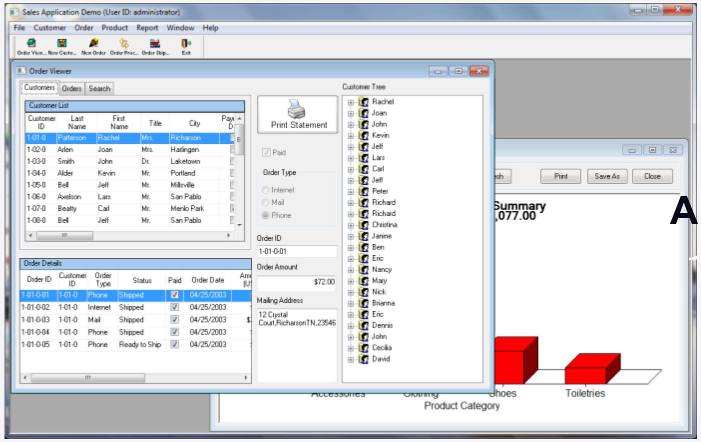
What is Appeon?

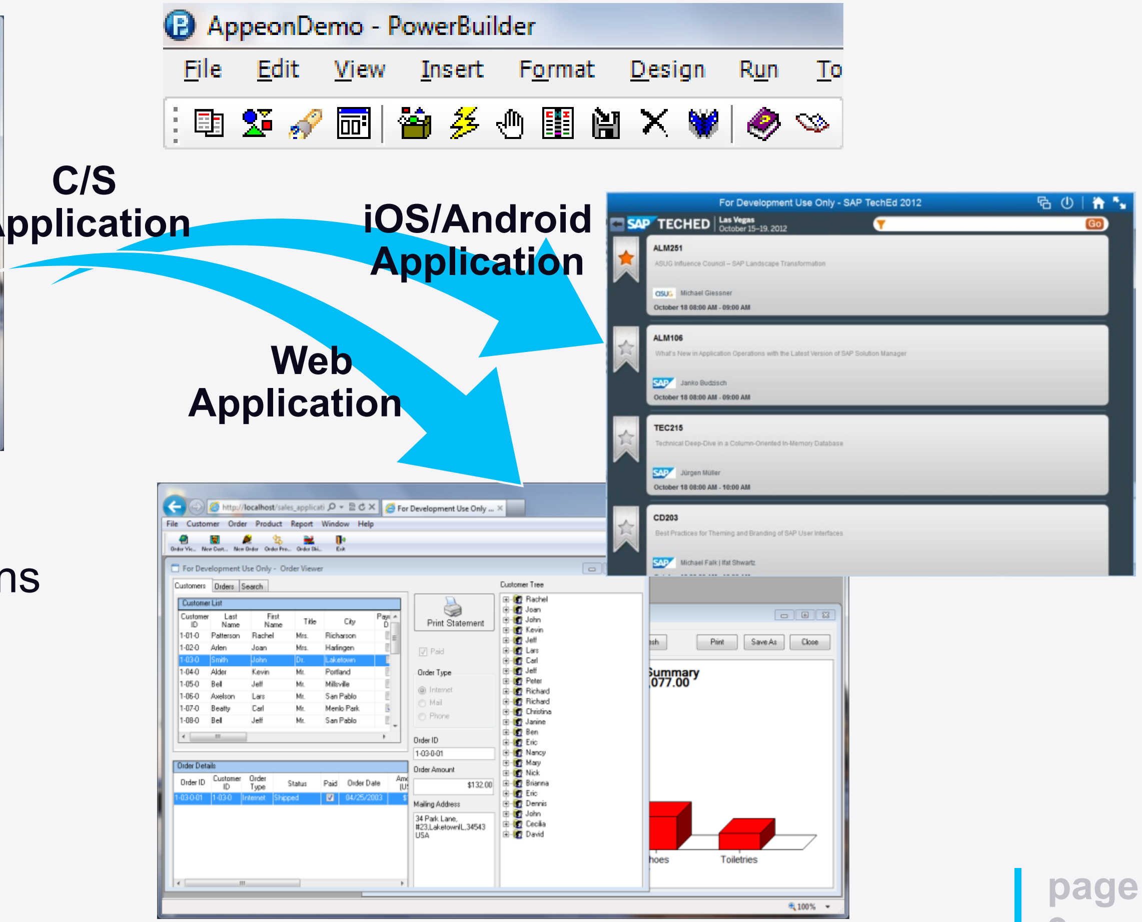


Why Appeon?

	Appeon	Citrix	HTML Rewrite
UI Fidelity	●●●●●	●●●●●	◐○○○○
PB Features	●●●●○	●●●●●	◐○○○○
Client-side Integration	●●●●●	●●●○○	●○○○○
Server-side Integration	●●●●○	●●●○○	●●●●●
Mobile Feature Support	●●●◐○	○○○○○	●○○○○
Scalability	●●●●●	●◐○○○	●●●●●
Time Savings	●●●●○	●●●●●	○○○○○
Cost* Savings	●●●●●	●●○○○	○○○○○

How Appen works

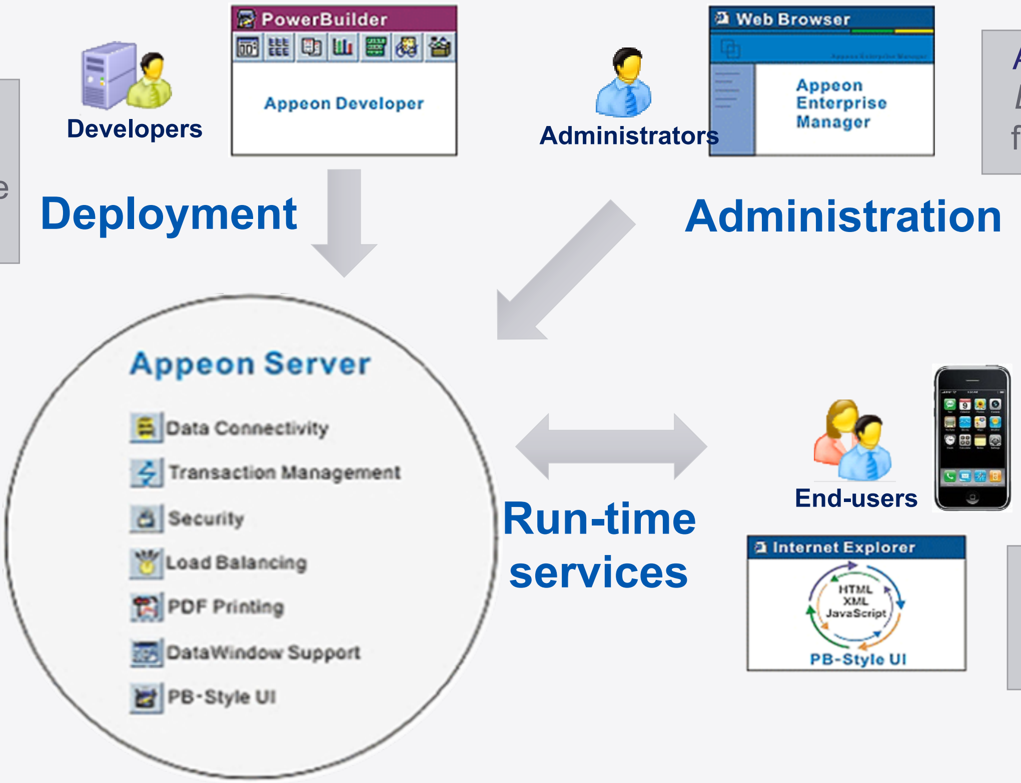




- Add-on to PowerBuilder
- Deploy .Net & Java Applications
- Development remains in PB
- UI is unchanged
- Event-driven logic

3-tier platform for Web/Mobile apps

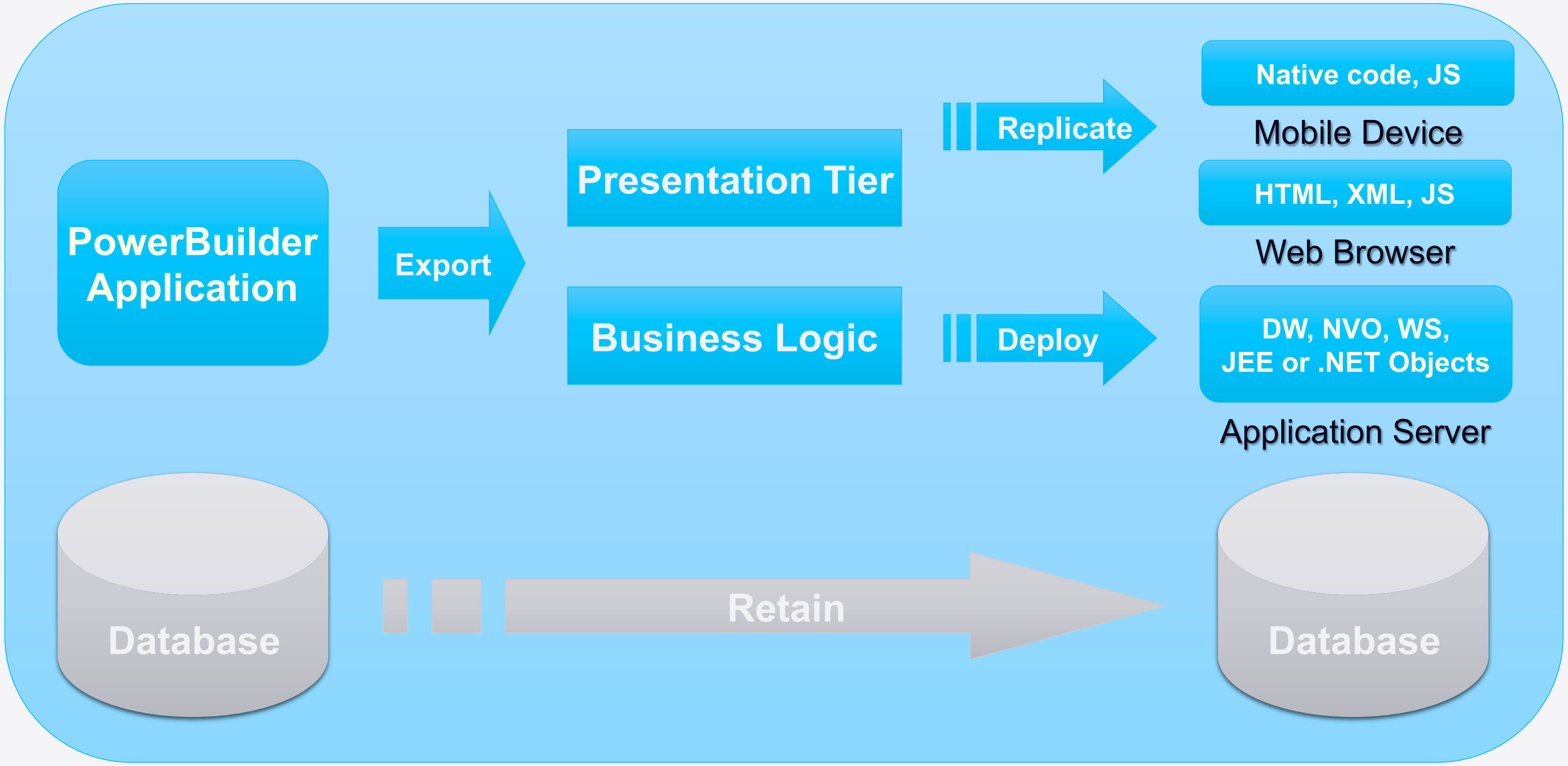
Developers create the application with PB and use *Appeon Developer* to deploy the application on *Appeon Server*



Administrators *use Appeon Enterprise Manager* (AEM) for administration purposes

Users access the application with their browser or handheld

Appeon partitioning approach



System Requirements

- PowerBuilder: PB 9 - PB2017
- Mobile: iOS, Android
- Web Browser: Edge, IE, Firefox, Chrome on Windows
- Application Server: MS IIS, IBM WebSphere, Oracle WebLogic, Apache, JBoss
- Server OS: Windows Server, Red Hat Linux, IBM AIX
- Database: SAP ASA/ASE/IQ/HANA, MS SQL Server, Oracle, Informix, IBM UDB DB2, Teradata, PostgreSQL, MySQL

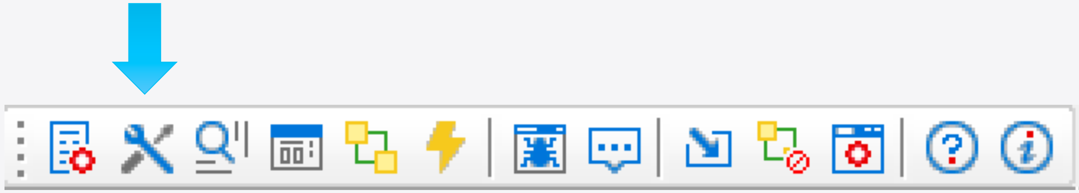
Key Features

- ✓ All DataWindows Styles
- ✓ All Window Types
- ✓ All UI Controls & User Objects
- ✓ Common System Objects
- ✓ Most PowerScript

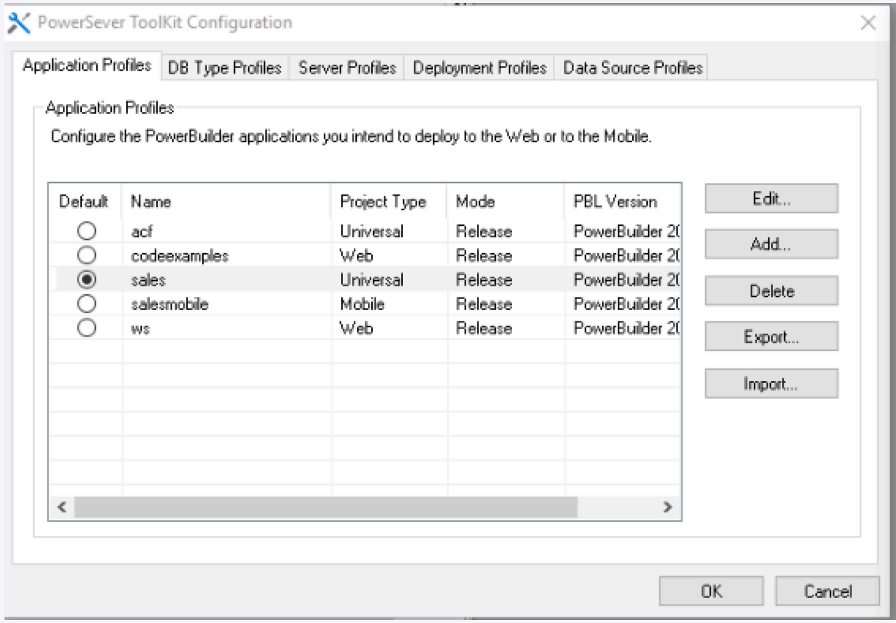
- ✗ PBScript: GOTO, THROW, THROWS
- ✗ DW: TableBlob Control
- ✗ System Funcs: DDE, Shared Objects
- ✗ System Objects: CPlusPlus, Error, Throwable, OLEStorage, Pipeline

Appeon Toolkit

Configure



- Specify settings for Appeon server, applications’ DB & runtime…

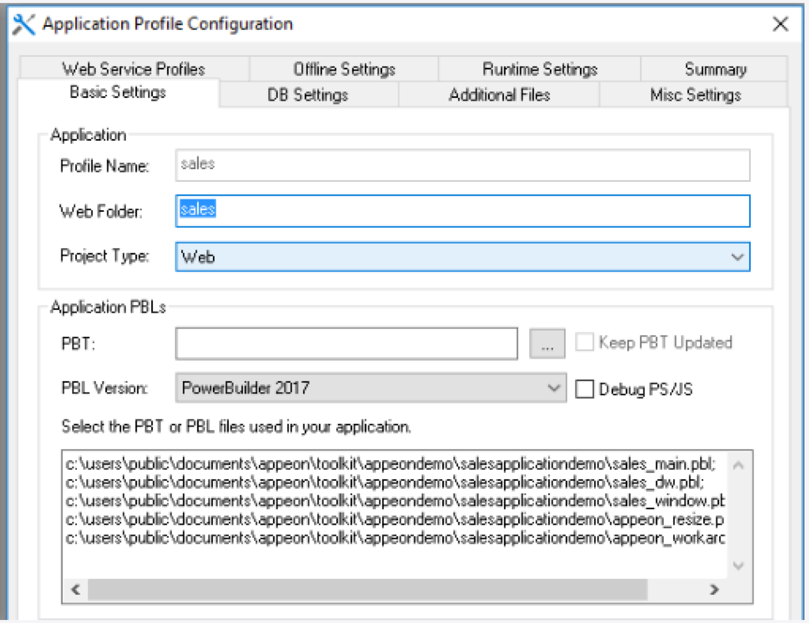


PowerSever ToolKit Configuration

Application Profiles

Configure the PowerBuilder applications you intend to deploy to the Web or to the Mobile.

Default	Name	Project Type	Mode	PBL Version
○	acf	Universal	Release	PowerBuilder 20
○	codeexamples	Web	Release	PowerBuilder 20
●	sales	Universal	Release	PowerBuilder 20
○	salesmobile	Mobile	Release	PowerBuilder 20
○	ws	Web	Release	PowerBuilder 20



Application Profile Configuration

Application

Profile Name: sales

Web Folder: sales

Project Type: Web

Application PBLs

PBT:

☐ Keep PBT Updated

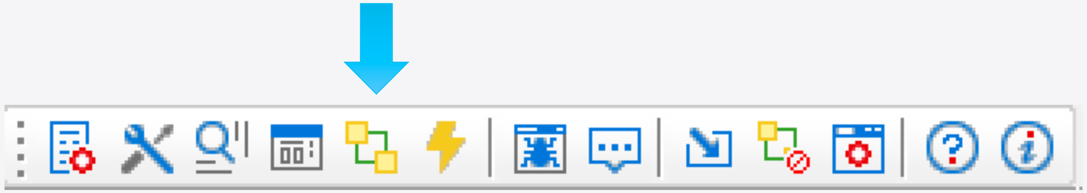
PBL Version: PowerBuilder 2017

☐ Debug PS/JS

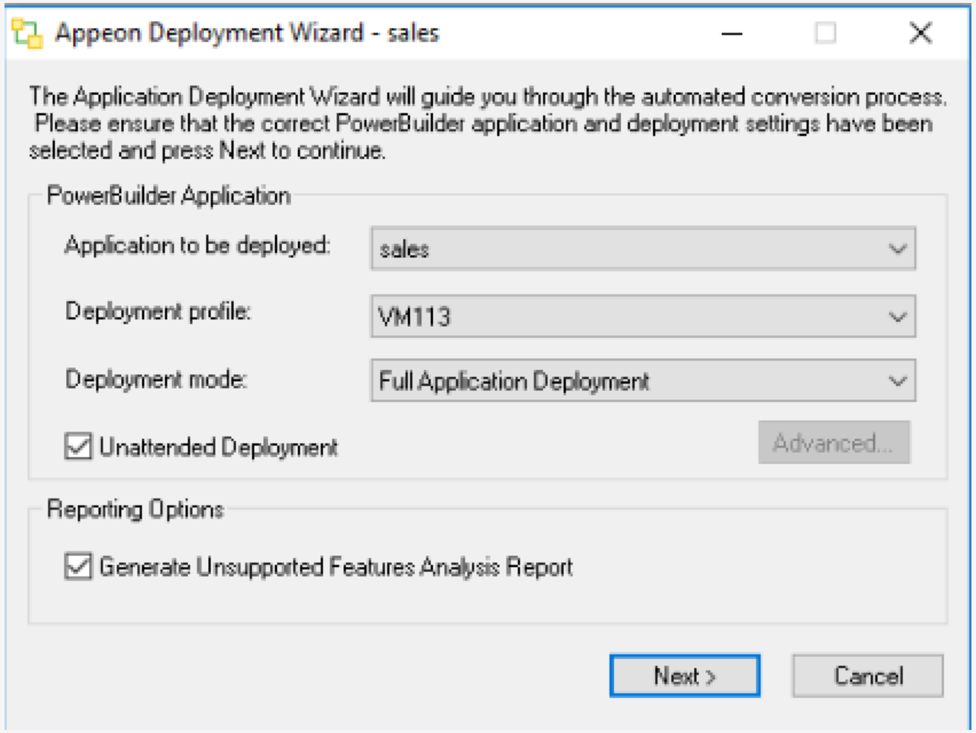
Select the PBT or PBL files used in your application.

```
c:\users\public\documents\appeon\toolkit\appeondemo\salesapplicationdemo\sales_main.pbl;
c:\users\public\documents\appeon\toolkit\appeondemo\salesapplicationdemo\sales_dw.pbl;
c:\users\public\documents\appeon\toolkit\appeondemo\salesapplicationdemo\sales_window.pb
c:\users\public\documents\appeon\toolkit\appeondemo\salesapplicationdemo\appeon_resize.p
c:\users\public\documents\appeon\toolkit\appeondemo\salesapplicationdemo\appeon_workarc
```

Deploy



- Trigger application deployment to selected server



Appeon Deployment Wizard - sales

The Application Deployment Wizard will guide you through the automated conversion process. Please ensure that the correct PowerBuilder application and deployment settings have been selected and press Next to continue.

PowerBuilder Application

Application to be deployed: sales

Deployment profile: VM113

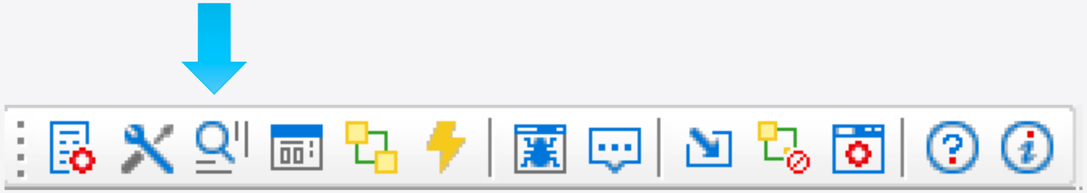
Deployment mode: Full Application Deployment

☑ Unattended Deployment

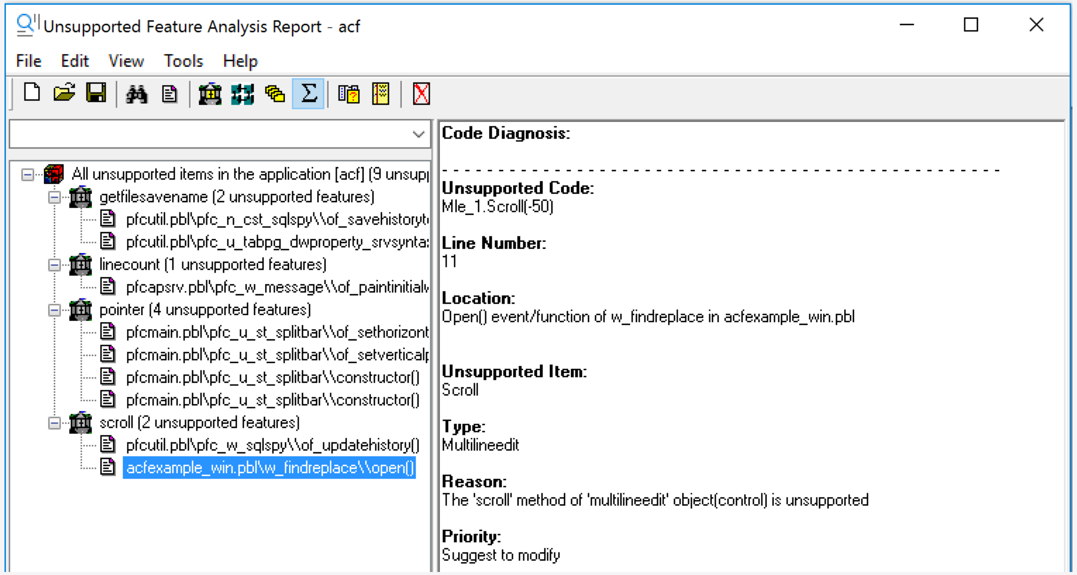
Reporting Options

☑ Generate Unsupported Features Analysis Report

Unsupported Features Analyzer



- Identify unsupported features based on keywords
- Provide you with location, line number, and code snippet



- All unsupported items in the application [acf] (9 unsup
  - getfilesavename (2 unsupported features)
    - pfcutil.pbl\pfc_n_cst_sqlspy\\of_savehistoryt
    - pfcutil.pbl\pfc_u_tabpg_dwproperty_srvsynta
  - linecount (1 unsupported features)
    - pfcapsrv.pbl\pfc_w_message\\of_paintinitial
  - pointer (4 unsupported features)
    - pfcmain.pbl\pfc_u_st_splitbar\\of_sethorizont
    - pfcmain.pbl\pfc_u_st_splitbar\\of_setverticalp
    - pfcmain.pbl\pfc_u_st_splitbar\\constructor()
    - pfcmain.pbl\pfc_u_st_splitbar\\constructor()
  - scroll (2 unsupported features)
    - pfcutil.pbl\pfc_w_sqlspy\\of_updatehistory()
    - acfexample_win.pbl\w_findreplace\\open()

Code Diagnosis:

- -

Unsupported Code:
Mle_1.Scroll(-50)

Line Number:
11

Location:
Open() event/function of w_findreplace in acfexample_win.pbl

Unsupported Item:
Scroll

Type:
Multilineedit

Reason:
The 'scroll' method of 'multilineedit' object(control) is unsupported

Priority:
Suggest to modify

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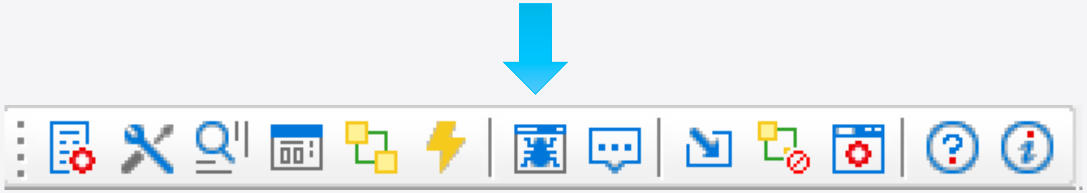
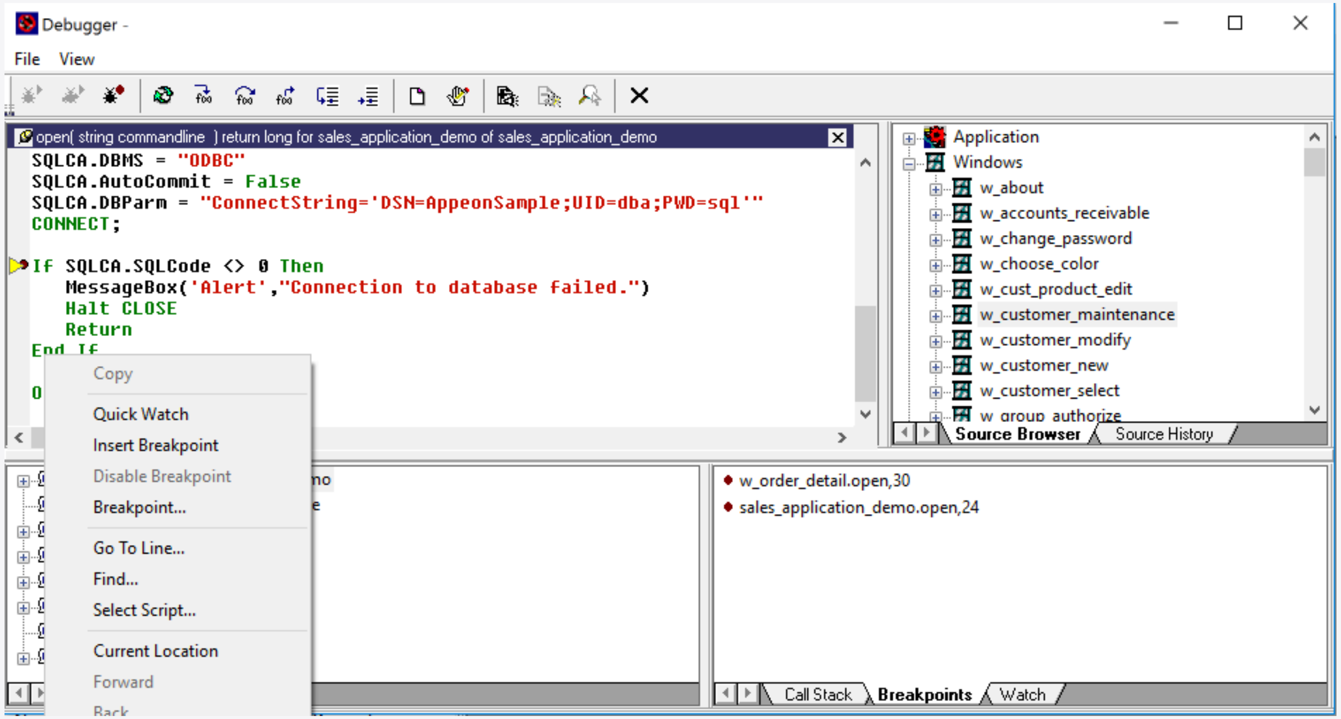
Debugger





open(string commandline) return long for sales_application_demo of sales_application_demo

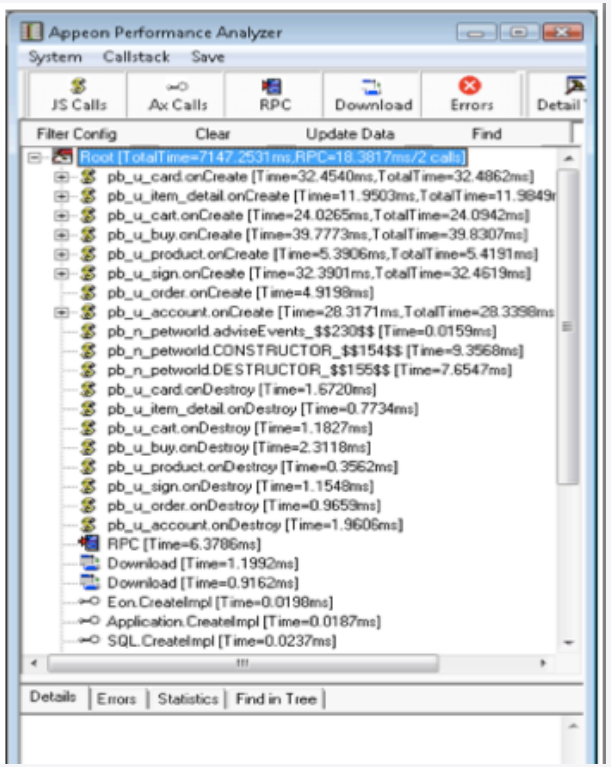
```
SQLCA.DBMS = "ODBC"
SQLCA.AutoCommit = False
SQLCA.DBParm = "ConnectString='DSN=AppeonSample;UID=dba;PWD=sql'"
CONNECT;

If SQLCA.SQLCode <> 0 Then
    MessageBox('Alert',"Connection to database failed.")
    Halt CLOSE
    Return
End If
```

- w_order_detail.open,30
- sales_application_demo.open,24

Performance Analyzer

- Analyze each individual JS | ActiveX | RPC | download calls
- Calculate the time used by function calls or object calls



```
Root [TotalTime=7147.2531ms,RPC=18.3817ms/2 calls]
    pb_u_card.onCreate [Time=32.4540ms,TotalTime=32.4862ms]
    pb_u_item_detail.onCreate [Time=11.9503ms,TotalTime=11.9849
    pb_u_cart.onCreate [Time=24.0265ms,TotalTime=24.0942ms]
    pb_u_buy.onCreate [Time=39.7773ms,TotalTime=39.8307ms]
    pb_u_product.onCreate [Time=5.3906ms,TotalTime=5.4191ms]
    pb_u_sign.onCreate [Time=32.3901ms,TotalTime=32.4619ms]
    pb_u_order.onCreate [Time=4.9198ms]
    pb_u_account.onCreate [Time=28.3171ms,TotalTime=28.3398ms
    pb_n_petworld.adviseEvents_$$230$$ [Time=0.0159ms]
    pb_n_petworld.CONSTRUCTOR_$$154$$ [Time=9.3568ms]
    pb_n_petworld.DESTRUCTOR_$$155$$ [Time=7.6547ms]
    pb_u_card.onDestroy [Time=1.6720ms]
    pb_u_item_detail.onDestroy [Time=0.7734ms]
    pb_u_cart.onDestroy [Time=1.1827ms]
    pb_u_buy.onDestroy [Time=2.3118ms]
    pb_u_product.onDestroy [Time=0.3562ms]
    pb_u_sign.onDestroy [Time=1.1548ms]
    pb_u_order.onDestroy [Time=0.9659ms]
    pb_u_account.onDestroy [Time=1.9606ms]
    RPC [Time=6.3786ms]
    Download [Time=1.1992ms]
    Download [Time=0.9162ms]
    Eon.CreateImpl [Time=0.0198ms]
    Application.CreateImpl [Time=0.0187ms]
    SQL.CreateImpl [Time=0.0237ms]
```

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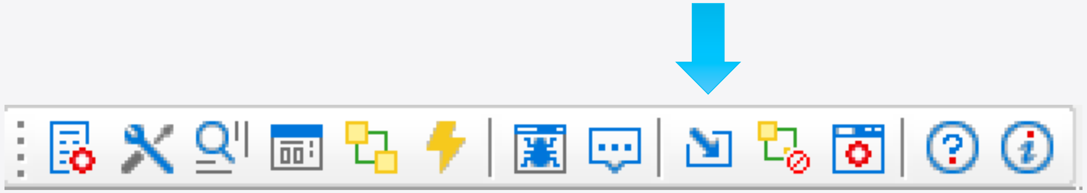
Package wizard

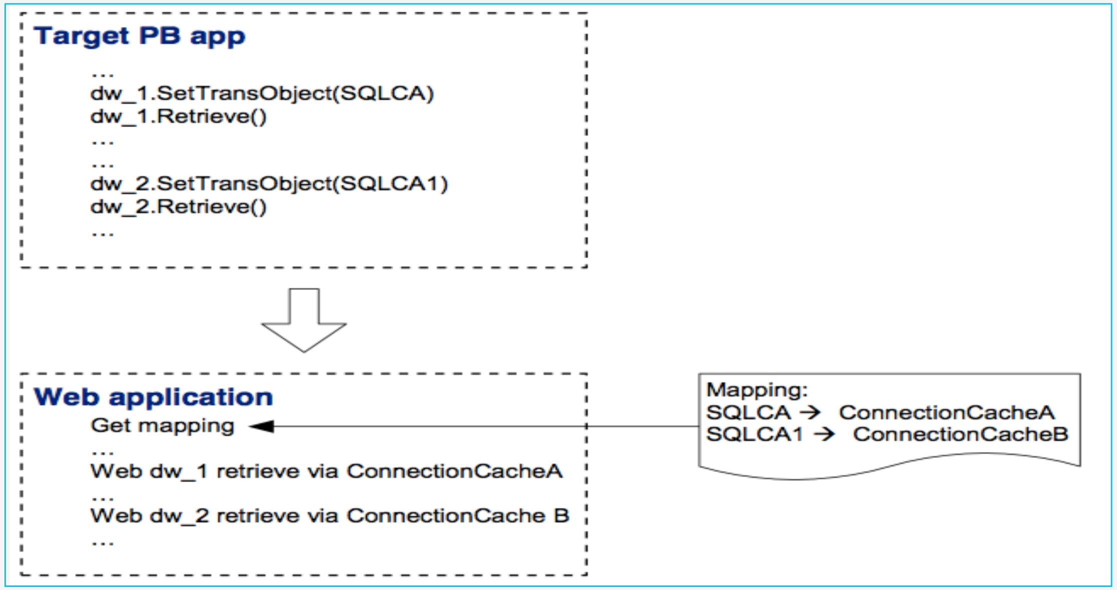


- Generate Windows' installation packages or native mobile apps
- No need for Appeon Developer to perform deploy
- No need to provide the PB source to users

Hands-on

Connection Cache

- Counterpart to the transaction object in a PB app
- Appeon apps rely on connection caches to interact with the DB
- Configurable in AEM or from the Appeon Toolkit



Target PB app

```
…
dw_1.SetTransObject(SQLCA)
dw_1.Retrieve()
…
…
dw_2.SetTransObject(SQLCA1)
dw_2.Retrieve()
…
```

Web application

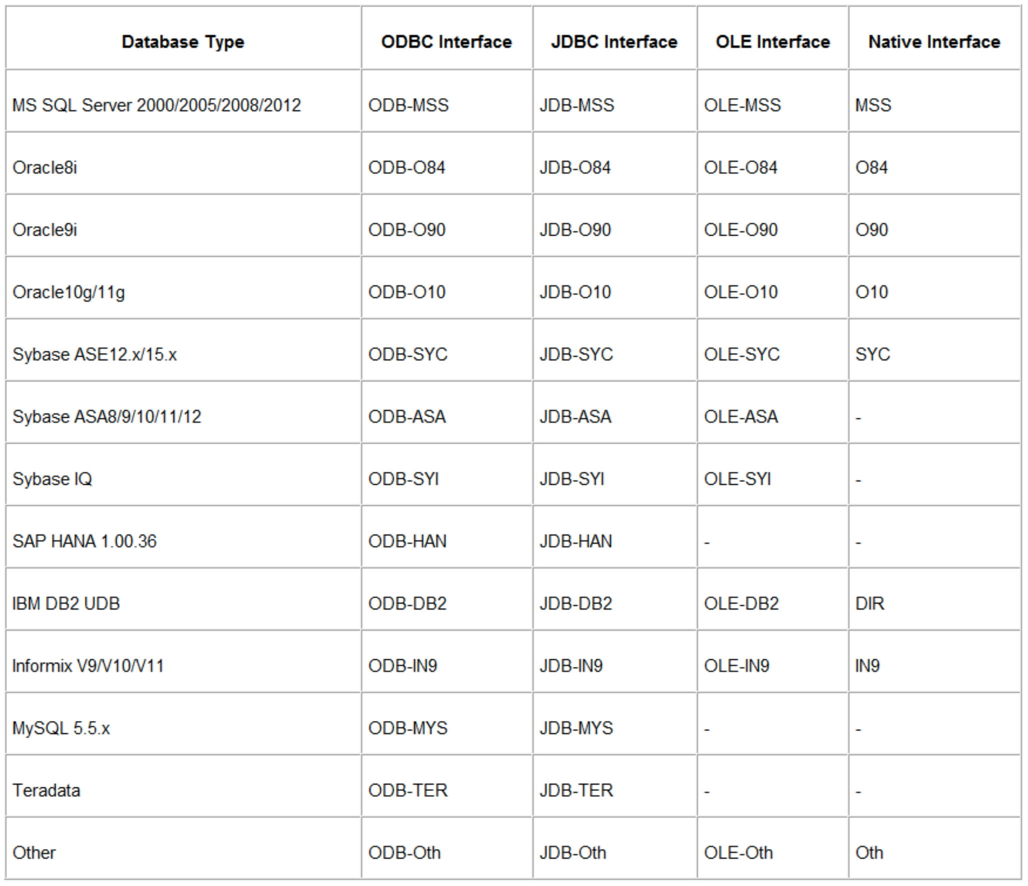
```
Get mapping
…
Web dw_1 retrieve via ConnectionCacheA
…
Web dw_2 retrieve via ConnectionCache B
…
```

Mapping:
SQLCA → ConnectionCacheA
SQLCA1 → ConnectionCacheB

Dynamic Connection Cache

- AEM: static mapping between transaction object and connection cache
- PB-Script: dynamic mapping
  - It has priority over static mapping in AEM

```
SQLCA.DBMS = "JDBC Interface"
SQLCA.DBParm="CacheName='jdbc/cachename'"
```

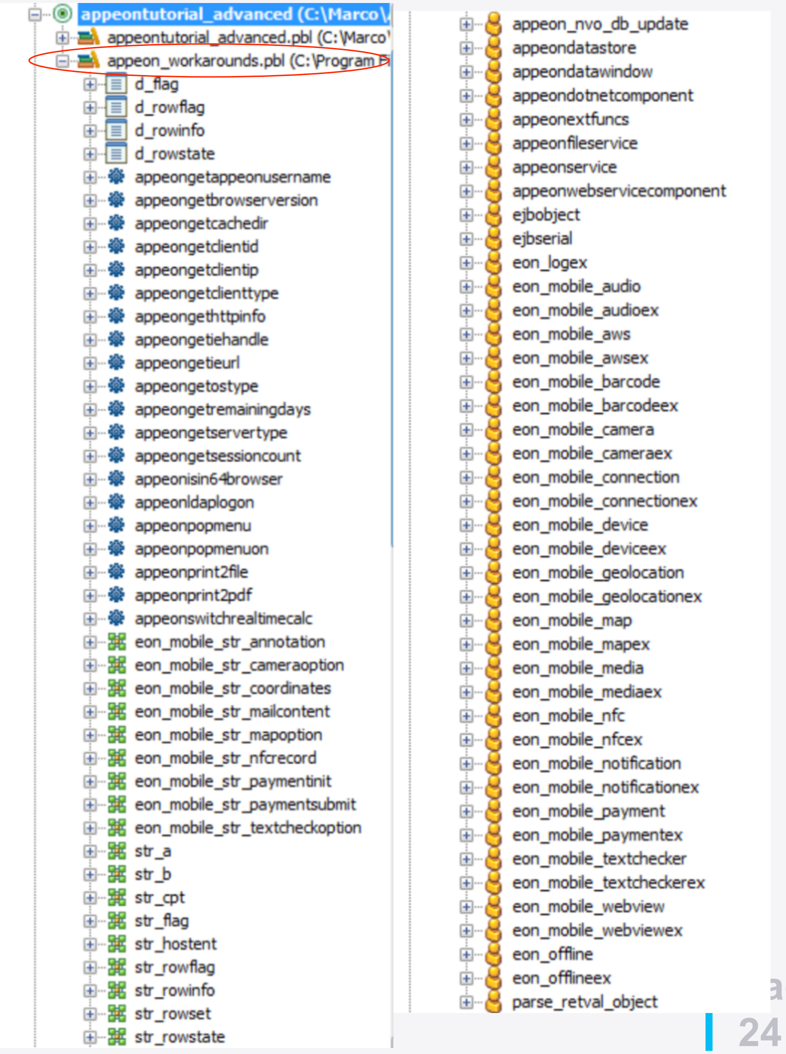


Database Type	ODBC Interface	JDBC Interface	OLE Interface	Native Interface
MS SQL Server 2000/2005/2008/2012	ODB-MSS	JDB-MSS	OLE-MSS	MSS
Oracle8i	ODB-O84	JDB-O84	OLE-O84	O84
Oracle9i	ODB-O90	JDB-O90	OLE-O90	O90
Oracle10g/11g	ODB-O10	JDB-O10	OLE-O10	O10
Sybase ASE12.x/15.x	ODB-SYC	JDB-SYC	OLE-SYC	SYC
Sybase ASA8/9/10/11/12	ODB-ASA	JDB-ASA	OLE-ASA	-
Sybase IQ	ODB-SYI	JDB-SYI	OLE-SYI	-
SAP HANA 1.00.36	ODB-HAN	JDB-HAN	-	-
IBM DB2 UDB	ODB-DB2	JDB-DB2	OLE-DB2	DIR
Informix V9/V10/V11	ODB-IN9	JDB-IN9	OLE-IN9	IN9
MySQL 5.5.x	ODB-MYS	JDB-MYS	-	-
Teradata	ODB-TER	JDB-TER	-	-
Other	ODB-Oth	JDB-Oth	OLE-Oth	Oth

Workaround Library

- Provides APIs that help work around the UFs or call Web/Mobile device native APIs

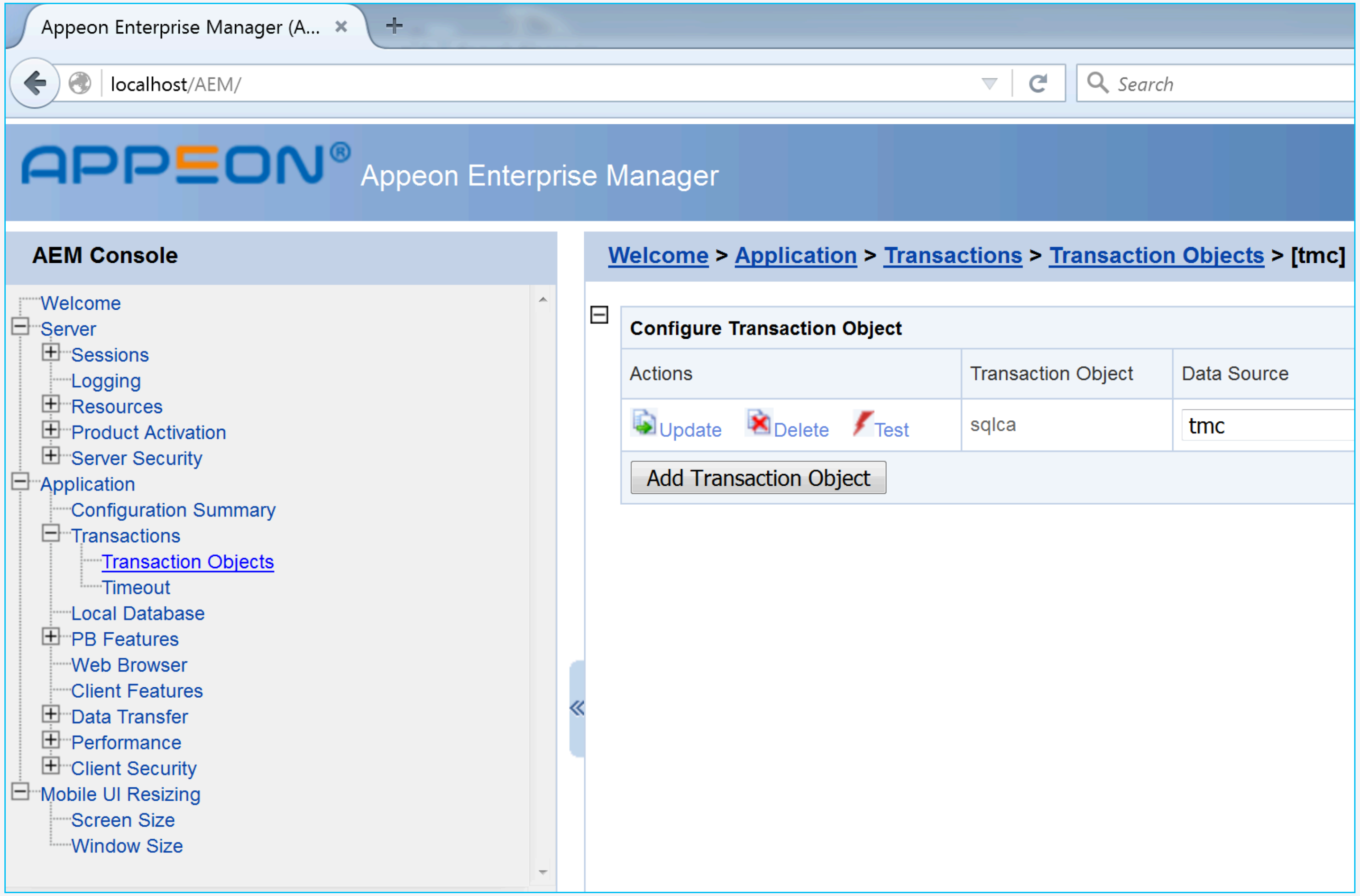
```
If AppeonGetClientType() = 'PB' Then
 SQLCA.DBMS = "ODBC"
 SQLCA.DBParm="ConnectString='DSN=db;UID=dba;PWD=sql'"

ElseIf AppeonGetClientType() = 'WEB' Then
 SQLCA.DBMS = "ODB-ASA"
 SQLCA.DBParm = "CacheName='mydb'"

ElseIf AppeonGetClientType() = 'MOBILE' Then
 [..]
End If
```



- appeontutorial_advanced (C:\Marco\
  - appeontutorial_advanced.pbl (C:\Marco'
  - appeon_workarounds.pbl (C:\Program F
    - d_flag
    - d_rowflag
    - d_rowinfo
    - d_rowstate
    - appeongetappeonusername
    - appeongetbrowserversion
    - appeongetcachedir
    - appeongetclientid
    - appeongetclientip
    - appeongetclienttype
    - appeongethttpinfo
    - appeongetiehandle
    - appeongetieurl
    - appeongetostype
    - appeongetremainingdays
    - appeongetservertype
    - appeongetsessioncount
    - appeonisin64browser
    - appeonldaplogon
    - appeonpopmenu
    - appeonpopmenuon
    - appeonprint2file
    - appeonprint2pdf
    - appeonswitchrealtimecalc
    - eon_mobile_str_annotation
    - eon_mobile_str_cameraoption
    - eon_mobile_str_coordinates
    - eon_mobile_str_mailcontent
    - eon_mobile_str_mapoption
    - eon_mobile_str_nfcrecord
    - eon_mobile_str_paymentinit
    - eon_mobile_str_paymentsubmit
    - eon_mobile_str_textcheckoption
    - str_a
    - str_b
    - str_cpt
    - str_flag
    - str_hostent
    - str_rowflag
    - str_rowinfo
    - str_rowset
    - str_rowstate
    - appeon_nvo_db_update
    - appeondatastore
    - appeondatawindow
    - appeondotnetcomponent
    - appeonextfuncs
    - appeonfileservice
    - appeonservice
    - appeonwebservicecomponent
    - ejbobject
    - ejbserial
    - eon_logex
    - eon_mobile_audio
    - eon_mobile_audioex
    - eon_mobile_aws
    - eon_mobile_awsex
    - eon_mobile_barcode
    - eon_mobile_barcodeex
    - eon_mobile_camera
    - eon_mobile_cameraex
    - eon_mobile_connection
    - eon_mobile_connectionex
    - eon_mobile_device
    - eon_mobile_deviceex
    - eon_mobile_geolocation
    - eon_mobile_geolocationex
    - eon_mobile_map
    - eon_mobile_mapex
    - eon_mobile_media
    - eon_mobile_mediaex
    - eon_mobile_nfc
    - eon_mobile_nfcex
    - eon_mobile_notification
    - eon_mobile_notificationex
    - eon_mobile_payment
    - eon_mobile_paymentex
    - eon_mobile_textchecker
    - eon_mobile_textcheckerex
    - eon_mobile_webview
    - eon_mobile_webviewex
    - eon_offline
    - eon_offlineex
    - parse_retval_object

AEM

Menu walk-through



Welcome > Application > Transactions > Transaction Objects > [tmc]

Configure Transaction Object

Actions	Transaction Object	Data Source
Update Delete Test	sqlca	tmc

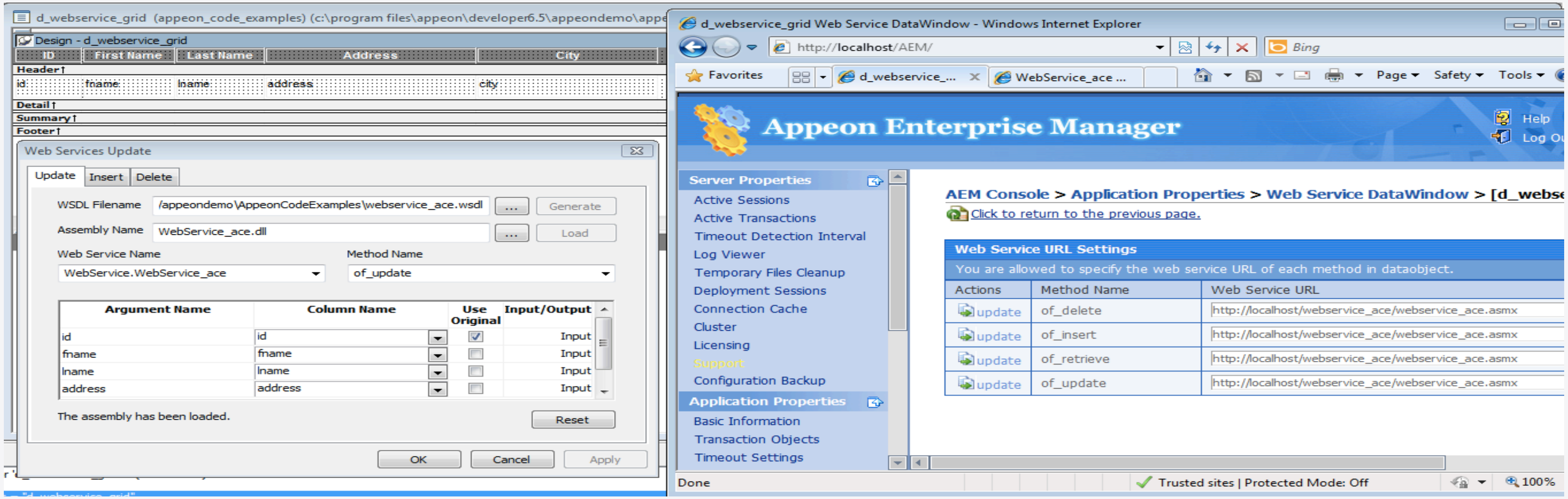
Middle Tier Interface

Web Service

- PB calls WS using `SoapConnection` object (pbwsclient12x.pbx)
- Appeon provides `AppeonWebServiceComponent` as proxy object

```
any paralist[]
appeonwebservicecomponent caller
caller = create appeonwebservicecomponent
caller.proxydllorurl= "http://localhost/webservice.asmx"
paralist[1]="param1"
paralist[2]="param2"
//invoke webservice method
aret = caller.of_callwebservice("GetUserName", paralist)
//get record set
recordset = caller.ReturnValue
```

Web Service Datawindow



WSDL Filename: /appeondemo\AppeonCodeExamples\webservice_ace.wsdl

Assembly Name: WebService_ace.dll

Web Service Name: WebService.WebService_ace

Method Name: of_update

Argument Name	Column Name	Use Original	Input/Output
id	id	☑	Input
fname	fname	☐	Input
lname	lname	☐	Input
address	address	☐	Input

The assembly has been loaded.

AEM Console > Application Properties > Web Service DataWindow > [d_webse

Click to return to the previous page.

Web Service URL Settings

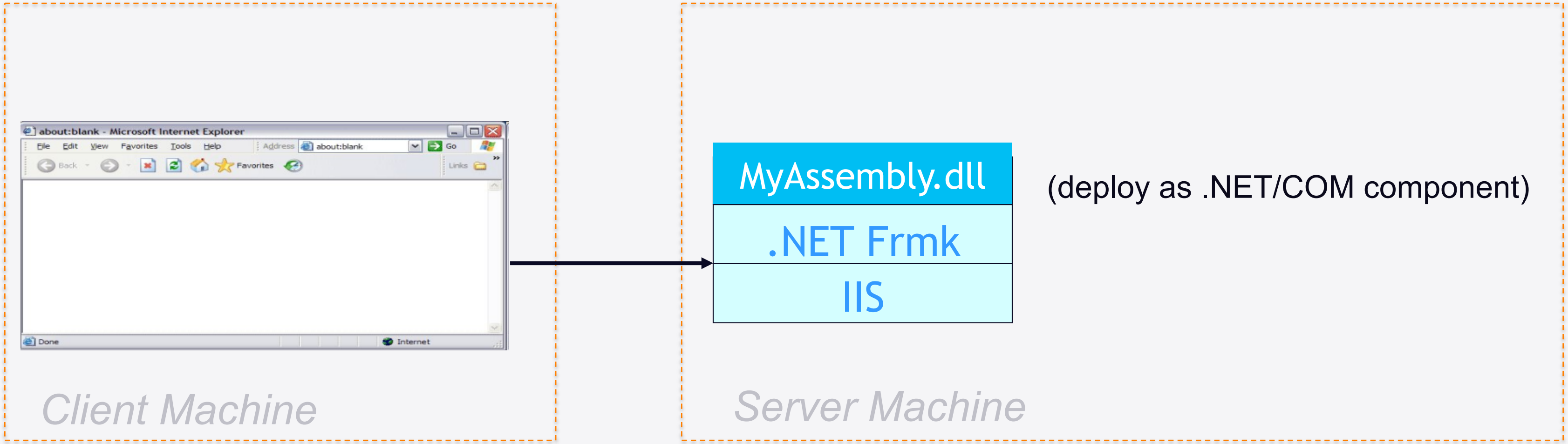
You are allowed to specify the web service URL of each method in dataobject.

Actions	Method Name	Web Service URL
update	of_delete	http://localhost/webservice_ace/webservice_ace.asmx
update	of_insert	http://localhost/webservice_ace/webservice_ace.asmx
update	of_retrieve	http://localhost/webservice_ace/webservice_ace.asmx
update	of_update	http://localhost/webservice_ace/webservice_ace.asmx

```
dw_1.DataObject = 'd_mydw'
Wsconnection lws_connection
lws_connection = CREATE wsconnection
lws_connection.authenticationmode = "basic"
lws_connection.username = "appeon"
lws_connection.password = "appeon"
lws_connection.endpoint = "http://localhost:8080/greetingWS/greeting.asmx"
dw_1.SetwsObject(lws_connection)
dw_1.Retrieve('hello')
DESTROY lws_connection
```

.NET Assembly

- Appeon provides the `AppeonDotNetComponent` NVO to call assemblies (DLL)


about:blank - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Address about:blank
Go
Back
Favorites
Links
Done
Internet

MyAssembly.dll

.NET Frmk

IIS

(deploy as .NET/COM component)

Client Machine

Server Machine

```
mynet = Create AppeonDotNetComponent
mynet.TypeLib = "MyAssembly.dll"
lRet = mynet.of_ExecInterface("Add", la_any)
```

File Service

- Store files on a Web Server
- Control the server folder from PowerBuilder
  - Share files between Appeon Web and Mobile
  - Use your camera to fill a Web catalogue
  - Use Appeon APIs or file functions to check/cache files

```
afs.of_logonFileServer('localhost', 80, 'username=appeon;password=appeon')
afs.of_logoffFileServer()

afs.of_fileExists (ls_filename)

ls_url = afs.of_appeonUpload (ls_source, ls_target, ib_rename, ref ll_errcode)
ll_rc = afs.of_appeonDownload (ls_source, ls_target)
```

Performance

Runtime Performance

- Reduce Server Calls
- Background knowledge:
  - Any code that results in a HTTP request (server call) when executed multiple times sequentially has potential to create network chatter
    - Data Access (Embedded/Dynamic SQL, SPs, DW/DS functions & events)
    - RMI (PB NVO, Java EJB, .NET Component) and WS
  - Appeon provides labels to group server calls and DW caching to buffer static data

Runtime Performance (cont)

Appeon provides labels to *group* server calls

```
dw_1.Retrieve()
dw_2.Retrieve(ll_parm)
dw_3.Update()
```

3x faster

```
• appeon_nvo_db_update inv_appeondb

• inv_appeondb.of_startqueue( )
•  dw_1.Retrieve()
•  dw_2.Retrieve()
•  dw_3.Update()
• inv_appeondb.of_commitqueue( )
```

```
if dw_1.update() then
 if dw_2.update() then
  if dw_3.update() then
   commit;
  else
   rollback;
 else
  rollback;
else
 rollback;
end if
```

3x faster

```
appeon_nvo_db_update inv_appeondb
inv_appeondb.of_update(dw_1,dw_2,dw_3)
```

Runtime Performance (cont)

Each line of PB code is *compiled* into binary code

PBscript is translated into JavaScript, which is *interpreted* by the Web Browser

- PB applications contain lots of legacy code
  - rich GUI, complex data manipulation (arrays, structures…)
- Usually PBscript runs fine in the browser even if it becomes JS
  - There are some extreme cases not commonly found in most PB apps

Appeon Web (Recap)

- Windows, UI Controls, VO/NVO
- System Objects, PowerScript

JS WebLibrary

- Windows Registry, File System
- Local devices (printer, scanner, barcode…)
- Win32 DLL, OLE/OCX

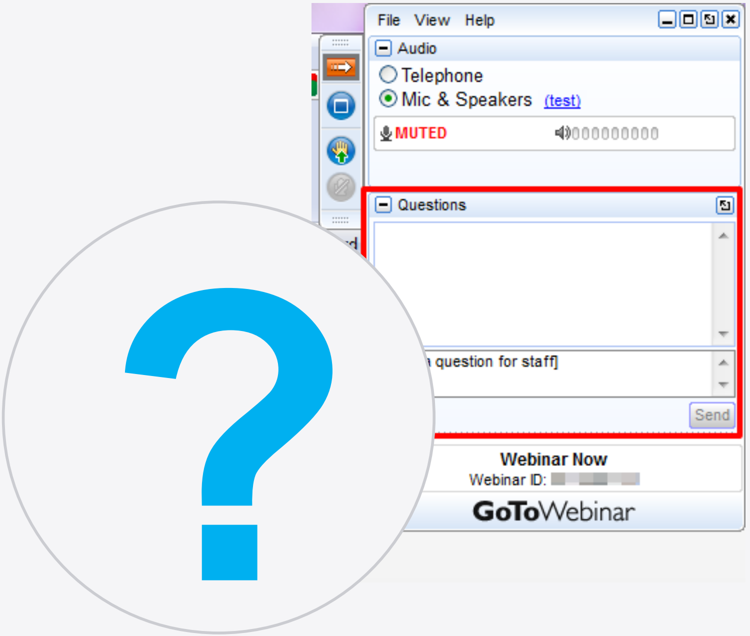
Appeon Plugin

- DW/DS
- Web Service DW
- .NET Assembly, File Service

Appeon Server

Ask the Expert

We will do our best to
answer all questions now
or later by email.



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Thank You