DataFlex 2019 - 19.1

Presenter: Stephen W. Meeley

SYNERGY 2019

CRUISING TO NEW HORIZONS

DataFlex 18.0

- Rebranding
- Web - Version 2 of the Web Framework
- Web - Grid/List, Upload class, SuggestionForm
- Windows - new classes, buttons w/ images, LinkButton, dbSuggestionForm
- Windows - optional modal views
- Studio Table Viewer
- Studio Native SQL Type Modeling
- DD - DD SQL Filtering
- DD - DD Inspector has constraint usage, optimization and SQL filter info
- Client Web Services - nullable data type support
- Character encoding translation class

- What's New in DataFlex 18.0

DataFlex 18.1

- Web - Introduced mobile framework!
- Web - Complex web properties (structs and arrays)
- Web Designer – Previewer evolved into interactive designer
- Studio - Debugger much faster
- DD - Big performance and memory improvements
- Connectivity – PK support, identity column, GUID, Azure, better restructure
- UChar Array improvements - tables, sequential files, String to UChar functions
- Many new struct/array functions
- Improved missing (deleted) record handling

- What's New in DataFlex 18.1

DataFlex 18.2

- Primarily created to fix bugs and implement suggestions
- Web - Version 2 of the Mobile Web Framework
- Web – cWebParentCombo, new desktop theme
- Web - Web DD Inspector
- Windows - Windows 10 Support
- Windows - ParentCombo, month calendar
- Studio - pre/post compile processing
- DDs - Smart Relates
- Refined deleted/missing record handling
- Extensive new set of DateTime functions

- What's New in DataFlex 18.2

DataFlex 19.0

- Connectivity – Managed Connections
- Connectivity – Improve indexing support
- Windows Framework – Enhanced high DPI Support
- Windows Framework – Updated look
- Windows Framework – An MDI alternative style
- Studio – More natural developing using SQL
- Studio – Updated look
- Web Framework – Server Web Properties
- Web Framework – New Controls
- Web Application Server – Simplified deployment
- Web Application Server – 64-bit support
- Runtime – JSON Parser

- What's New in DataFlex 19.0

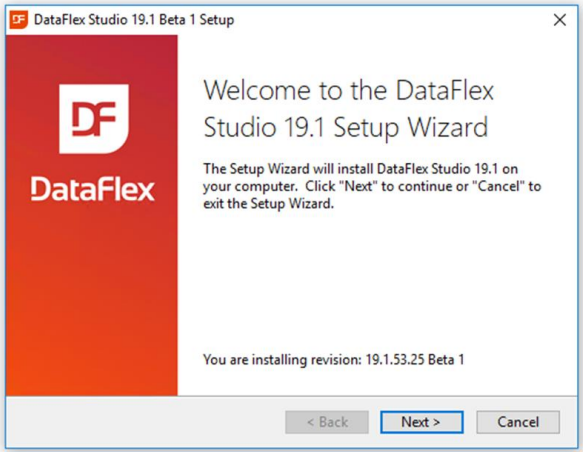
DataFlex 19.1

- General
  - New Installer
  - Embedded Manifest Files
  - Language and Code Cleanup
  - Compiler Warnings
  - Live DataFlex Reports Examples
- Windows Applications
  - Enhanced DPI Awareness
  - Improved and Configurable Form Heights
- Connectivity
  - Support for SQL Server 2017
  - Parameterized Queries
  - Configurable Cursor Types
  - Managed Connections Enhancements
- Web Applications
  - HTTP Handler
  - History Management and Deep Linking
  - Material Design Theme
  - Expandible Lists
  - Horizontal Scrolling
  - IPv6 Support

General

New Installer

- Provides a crisp, modern look across all monitor resolutions
- Ready for 64-bit
- Optional automatic IIS configuration (Studio and Server)
- Optional installation of example applications
- Command line interface for controlling an embedded installation



- MSI Based
- Created using Advanced Installer

Embedded Manifest Files

- DataFlex 19.1 has a new linker
  - Ready for supporting 64-bit
- Supports embedding the manifest file
  - New option under project properties
- Manifest file moved to AppSrc
  - Migration wizard will offer to do this for you
  - If embedding is turned off it will be copied to Programs by the Studio

Language and Code Cleanup / Compiler Warnings

- Cleanup of FMAC and the package library
- Compiler Warnings for
  - Obsolete commands
  - Obsolete global functions
  - Use of Indicate command instead of Move command
  - Use of “Local” in commands to define local variable
  - Use of “public” or "private" in property commands
  - Obsolete classes
  - Inclusion and use of obsolete packages (raised when a pkg is used)

- **Getting Your Applications Ready for DataFlex NextGen**
  - Stephen Meeley, Tuesday 9:15

Live DataFlex Reports Examples

- The examples now run live reports
  - Used to be static PDF for simulated output
- Expanded set of report examples for both Web and Windows
- Special example version of the DataFlex Reports runtime
  - Does not collide with real runtime
  - Your deployment still requires the full DataFlex reports runtime

- **DataFlex Reports Update**
  - Vincent Oorsprong, Tuesday 10:35

Windows Applications

Enhanced DPI Awareness

- A number of changes in the runtime, packages, Studio and Migration Wizard work together to provide your Windows applications a more consistent and controllable level of DPI awareness...
  - More accurate scaling metrics
  - Form heights are now consistent and defaults set at the workspace level
    - You have the choice to scale comboforms (default is on)
    - Existing (migrated) workspaces will stay at 13, spacing of 2 (unless you change them)
    - New workspaces will default to 12, spacing of 2
  - Proper Icon scaling in cImageList32
  - Improved DPI awareness in Buttons and TreeViews

About Scaling Metrics…

- We have changed the way the conversion between horizontal dialog units and pixel units are calculated
  - This method is identical to the old method, which is the official way Microsoft says it should be done, but it is performed at a higher precision
  - The result is the impact of rounding is much smaller. What this does is greatly reduce the difference in layout at different DPI – specifically there will be a less clipping at 125%
  - In case you are interested in the particulars…
    - 100% rounds up (creating extra space)
    - 125% rounds down (creating less space)
    - 150% rounds slightly up
- This change makes these differences less dramatic
- This makes moving between different DPIs much more consistent
- This also makes it easy to design at any DPI you want on your computer with the knowledge that it will look good at different targets

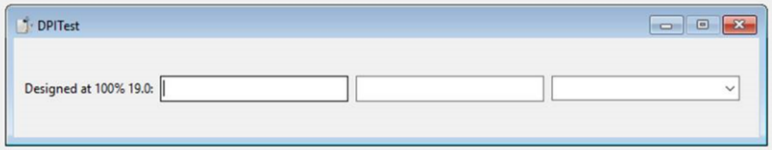
How will this impact your applications?

- If you designed at 100%, you now have a little less space, which might result in clipping at 100%
  - If this is the case, you already have real problems at 125%
  - Once you clean things up at 100% (or at any DPI), it works well everywhere
- We added a new desktop property, pbLegacyDialogRatio, in cApplication to control this
  - By default it is false, which uses the more accurate metrics. Setting this True makes things worked like they used to
- Since this is not a compiler change, any application will use this new behavior
- If you look carefully you will notice that the view sizes are actually a little different at each DPI (100% less wide, 125% wider, 150% about the same)

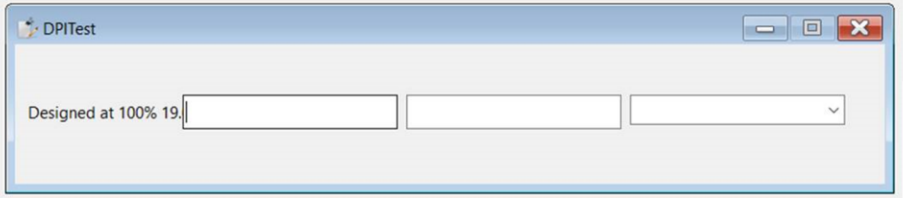
- Note - If you try this at different DPIs you must log out and sign in after any DPI change. If you just change the setting, the results you get are probably wrong

Scaling Metrics 19.0

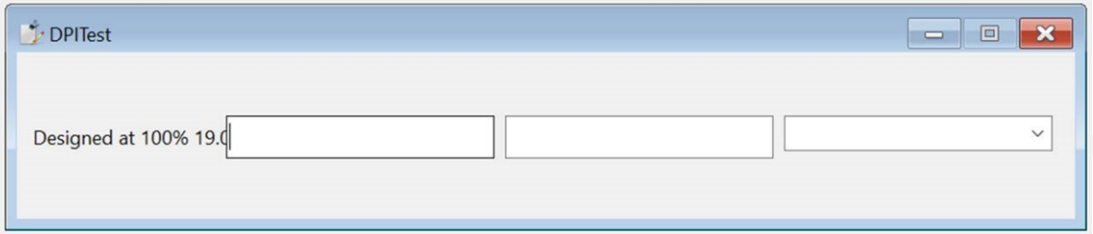
100% - 19.0



125% - 19.0

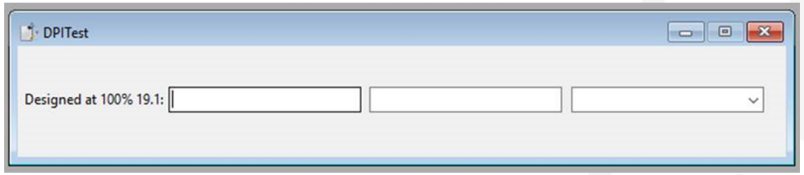


150% - 19.0

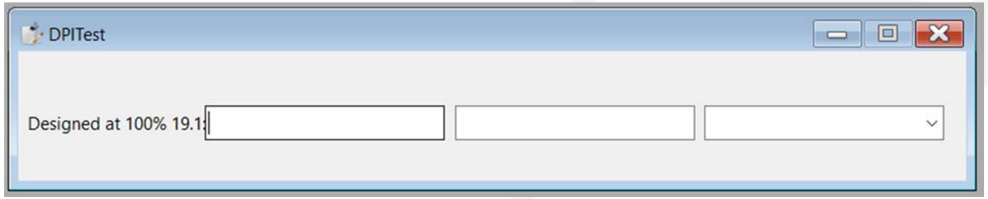


Scaling Metrics 19.1

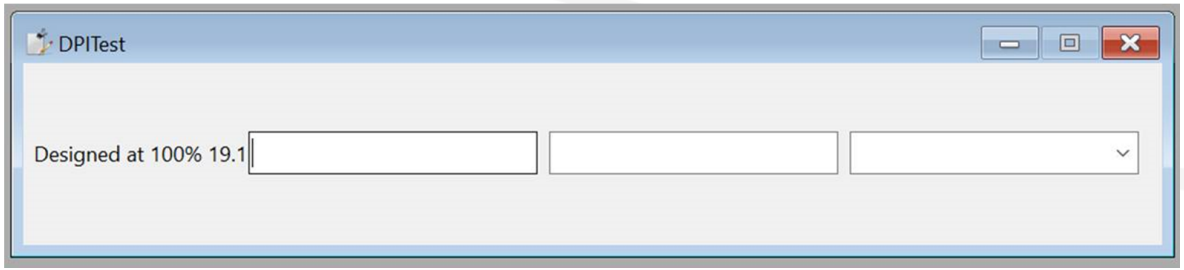
100% - 19.1



125% - 19.1

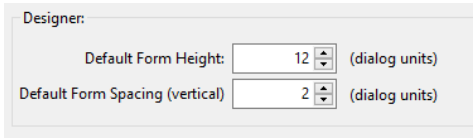


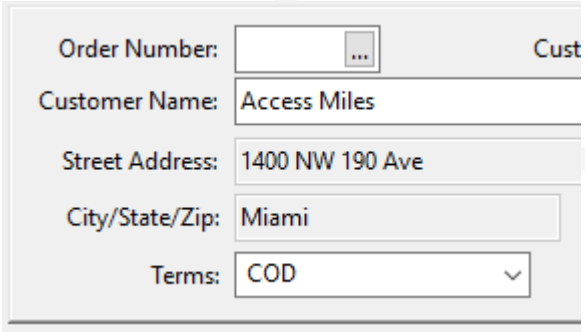
150% - 19.1

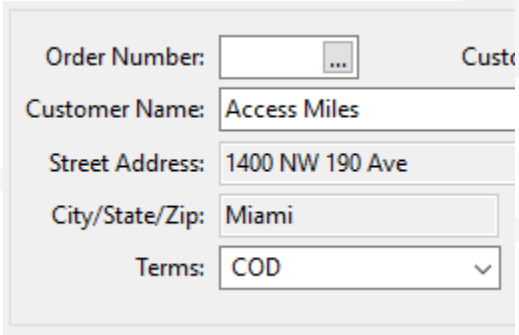


Improved and Configurable Form Heights

- Default form heights configurable at workspace level
- New default changed from 13 to 12
  - More consistent with other windows software
  - Migrated workspaces will stay on 13 until you change them
- ComboForms will scale now too







Connectivity

SQL Server 2017 Support

- The MSSQLDRV driver will now recognize the following clients. The highest installed client version on a workstation will be used:

Client Name	SQL Server Version	Version Number
SQL Server	SQL Server 2000 client	8
SQL Native Client	SQL Server 2005 client	9
SQL Server Native Client 10.0	SQL Server 2008 client	10
SQL Server Native Client 11.0	SQL Server 2012 client	11
ODBC Driver 11 for SQL Server	SQL Server 2014 client	12
ODBC Driver 13 for SQL Server	SQL Server 2016 client	13
ODBC Driver 17 for SQL Server	SQL Server 2017 client	17

- Control Combinations with additional attributes
  - DF_DRIVER_MINIMUM_CLIENT_VERSION
  - DF_DRIVER_MATCH_CLIENT_SERVER_VERSION

Parameterized Queries

- Protection against SQL Injection
  - The query itself and the parameter values are sent to the SQL server separately.
  - Queries without parameters are usually build by string concatenation of the (executable) SQL code and data values. If the data values are provided by user input, an attacker can enter executable SQL code as data and get unauthorized access to a database.
  - By using parameters, data is send to the server separate from the SQL code end makes SQL injection impossible.

- Prepared Execution ← This one can be BIG!
  - Prepared execution gives a performance gain when a query gets executed multiple times.
  - With prepared execution a query is prepared once and then executed multiple times with different parameters.
  - With prepared execution the SQL engine only has to create an execution plan once that can be re-used on subsequent executions.
  - Parameterized queries can also be used for queries that are only executed once (SQLExecDirect)

Parameterized Example

```
String[][] asResultSet

Get SQLConnectionId of ghoConnection "MssqlOrderID" to hdbc
Get SQLOpen of hdbc to hstmt

Send SQLPrepare of hstmt "SELECT * FROM OrderHea WHERE SalesPerson_ID = ? And Order_Date > ?"

// First execution of prepared statement
Send SqlSetParameter of hstmt 1 "MM" typeString
Send SqlSetParameter of hstmt 2 (DateSet(2015, 12, 25)) typeDate
Send SQLExecute of hstmt

Get SQLFetchResultSetValues of hstmt to asResultSet

Send SQLClose of hStmt
Send SQLDisconnect of hDbc
```

Configurable Cursor Types

- SQL_CURSOR_FORWARD_ONLY ← Default (the way we've always worked)
  - Usually the fastest way of processing a result set
  - Process from begin to end
  - Seezs changes made by others.
  - Variable length columns (varchar(max), nvarchar(max), varbinary(max) must be last in the SELECT
- SQL_CURSOR_STATIC
  - Result set at execution time
  - Changes made by other applications will not be seen by a static cursor
- SQL_CURSOR_DYNAMIC
  - Detect all changes made to the rows in the result set by other applications
  - Forward and backward
- SQL_CURSOR_KEYSET
  - Changed rows, but will not see changes to the membership and order of the result set

DataFlex 19.0 Connectivity Interlude…

Client & Server Only Indexes

- Server
  - Exists both on the server and in DataFlex
  - Must be unique
- Server Only
  - Exists at the server, but not in DataFlex
  - Compatibility with non DataFlex environments
- Client Only
  - Exists in DataFlex only (defined in .int)
  - Must be unique

Runtime Indexes

- Create index without restructure

```
Create_Index
Set_Attribute DF_INDEX_NUMBER_SEGMENTS
Set_Attribute DF_INDEX_SEGMENT_FIELD
Set_Attribute DF_INDEX_SEGMENT_DIRECTION
Delete_Index
```

- Do not use structure_start & structure_end
- Great for selection lists and business processes

SQL Filters

- SQL code that is automatically added to the WHERE clause
- Global
  - Table level
  - Applied to the entire application
- Local
  - DD level
  - Overrides global unless
- Use pbApplyGlobalSQLFilters to combine
- Constraints the way you've always wanted them to be…
  - All filtering offloaded to the server

Your applications taken to the next level…

- The combination of DataFlex and SQL is a game changer…
  - Managed Connections
  - Index mapping and runtime indexes
  - SQL filters
  - Stored procedures
  - All of what SQL does best, at your fingertips…

- **Confessions of an Old-Time DataFlexer**
  - Bob Cergol, Tuesday 9:55

Your applications taken to the next level…

- **Web Application Deployment Using SPLF**
  - Stephen Meeley, Tuesday 12:20
- **Reduce Application Coding with SQL-Based Components**
  - Frank Valcarcel, Thursday 11:30
- **MySQL and More for DataFlex**
  - Chip Casanave and Marcia Booth, Thursday 14:45
- **Multi-Tenancy in DataFlex Web Applications**
  - Vincent Oorporong, Thursday 15:45

Web Applications

HTTP Request Handler

- Handles complete HTTP requests in DataFlex code
- Connects to IIS as a module
- Provides the low-level interface needed for building REST services and any other HTTP service needed
- Processes binary and text data in chunks or as a whole
- Replaces the use of ASP for handling WebApp Framework file uploads and downloads

- **Expanding the World of Server Components**
  - Harm Wibier, Tuesday 11:20

History Management and Deep Linking

- Deep Links
  - URLs that point to specific views in the application
  - For drilldown the URLs contain the view stack
    - http://localhost/WebOrderMobile_19_1/#OrdersByCustomer/Orders-99/Order-2035
    - http://localhost/WebOrderMobile_19_1/#SalesPersons/SalesPerson-CM
- History Management
  - We made the back button work!
- **We Made the Back Button Work**
  - John van Houten, Thursday 10:45

Web Applications just keep getting better…

- DataFlex 2019 takes another leap forward to give you the controls and tools you need to develop world-class applications
  - Material Design
  - Expandable Lists
  - Horizontal Scrolling

- **Building Powerful Web Applications**
  - Harm Wibier, Thursday 9:45

Are there any questions?

Thank You!