DataFlex

# DATAFLEX STATUS & OVERVIEW

HARM WIBIER

# DID YOU MIGRATE TO UNICODE YET?

- DataFlex became fully unicode
  - Support multiple languages (characters sets) in a single application
  - Converted the runtime to Unicode
    - Strings in DataFlex became UTF-8
    - WString was added for communicating with UTF-16 API's (like windows)
- 64-bit
  - Option to compile your application for 64-bit
  - Studio became 64-bit

- Warnings (already in 19.1) should help with migration!
- DataFlex 20.1 solved many stability issues

# /* STAY UP-TO-DATE */

- Extended support of DataFlex 19.1 will end in 2026!
  - No more security updates from that point on!

- **Security Note**
  - DataFlex 19.1 and older WebApps do require proper application of redaction library to be secure!
  - Since DataFlex 20.0 this became part of the standard product

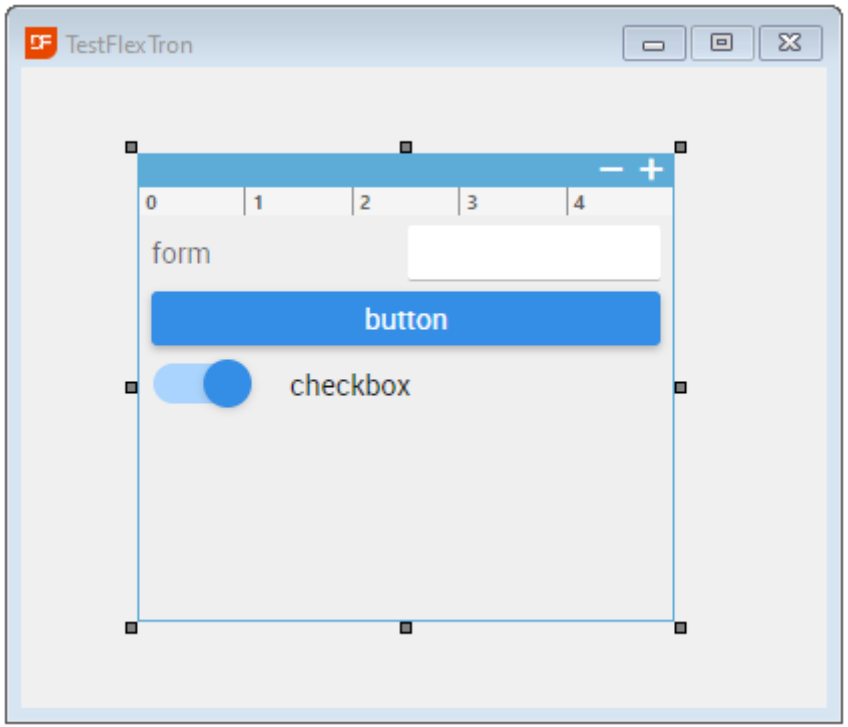
01

# FLEXTRON

# FLEXTRON
## WHAT IS FLEXTRON?

- Mix web controls in your Windows Applications
- No WebApp Server required
  - Deploy like windows applications
- Share code with WebApps

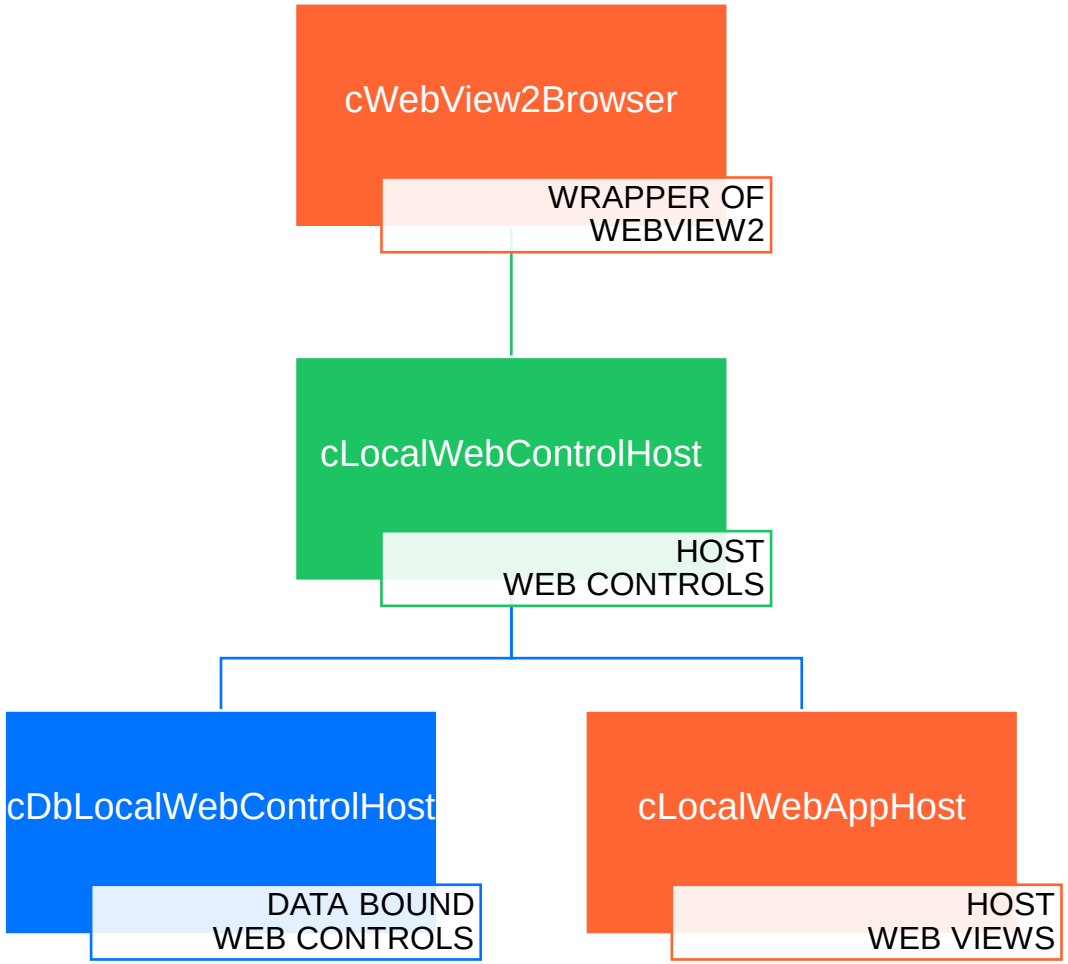
- Designer support in the studio



# FLEXTRON
# THE CODE

```
Object oWebHost is a cLocalWebControlHost
    Set Size to 282 368
    Set Location to 3 7
    Set peAnchors to anTopBottomLeft
    Set piColumnCount to 12

    Object oSample1FormInput is a cWebForm
        Set piColumnSpan to 10
        Set pbReadOnly to True
        Set pbShowLabel to False
    End_Object
End_Object
```

# FLEXTRON
# CLASS HIERARCHY



# FLEXTRON
# WEBVIEW2

- **WebView2 is the basis for FlexTron**
  - Mix web technologies into Windows applications
    - Render HTML snippets
    - Run JavaScript
    - API’s providing two-way communication
  - Build your own browser
  - Create fancy dashboards

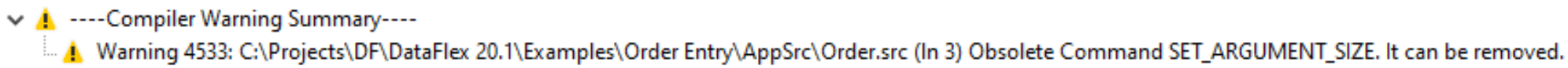
- Replaces the Internet Explorer based COM WebBrowser

# DID YOU KNOW ARGUMENT_SIZE WAS REMOVED IN DATAFLEX 2022?

# NO MORE ARGUMENT_SIZE!
DATAFLEX 2022

/* HISTORIC ARTIFACT REMOVED */

- Argument_Size was removed in DataFlex 2022
  - Runtime now dynamically manages central string buffers



02

# COMPILER IMPROVEMENTS

# COMPILER IMPROVEMENTS
## MULTILINE STRING

- String constants that spans multiple lines
- Nicer syntax for embedding SQL, HTML, JSON
- No compiler substitutions
- Improved in DataFlex 2023 with aligned syntax

```
Object oWebHtmlBox1 is a cWebHtmlBox
    Set piColumnSpan to 0
    Set psHtml to """
        <ul>
            <li>Item 1</li>
            <li>Item 2</li>
        </ul>
        """
End_Object
```

# COMPILER IMPROVEMENTS
## MULTILINE COMMENTS

```
/*
Field validation message that checks if the value contains a valid
email address. It also allows empty values. An email address is
considered valid if it contains an @ character and a .
*/

Function ValidateEmail Integer iColumn String sValue Returns Boolean
```

# COMPILER IMPROVEMENTS
## INCLUDE_TEXT

- Include text files as constant at compile-time
- Maintain large SQL queries in separate files

```
Include_Text OrdersGroup.sql as C_SQLOrdersGroup

Get SQLExecDirect of ghoSQLExecutor C_SQLOrdersGroup to aTheRows
```

03

# E-SQL SUPPORT

# E-SQL SUPPORT
## GOALS FOR DATAFLEX 2023

/* SINGLE LINE OF CODE TO EXECUTE AND FETCH */

- Make embedded SQL feel as part of the product
- Increase recognizability
- Simplify code
- Add studio support
- Improve performance

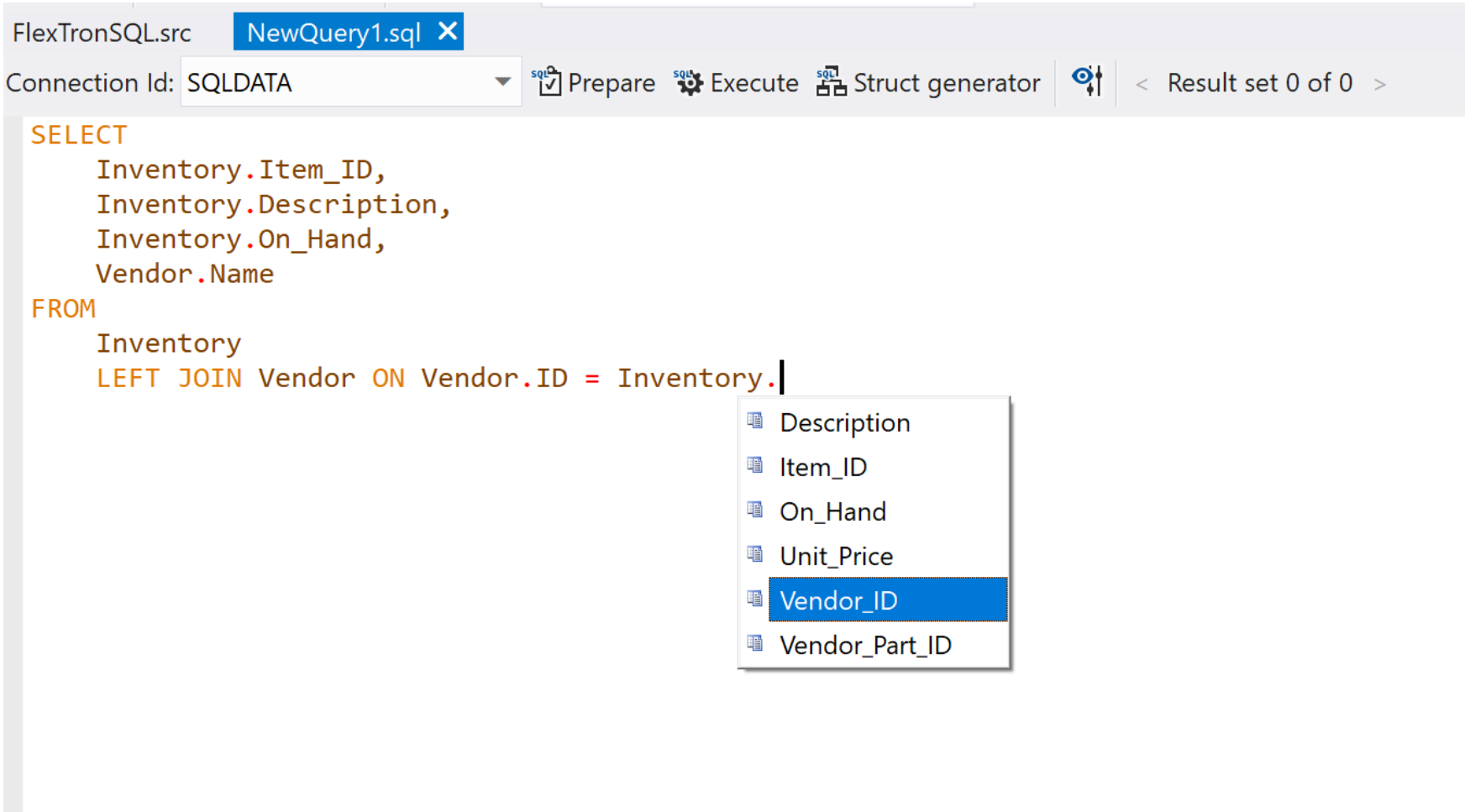
# E-SQL SUPPORT
# CSQLEXECUTOR

# /* FETCH LARGE DATASETS 4 TIMES FASTER */

- Single object for executing SQL statements
- Only configure the managed connection
- Resultset directly in native dataflex types
  - Variants
    - Converted to proper types
    - Works well with DataFlex Reports
  - Structs
    - Matched by column name
  - tWebRow, tDataSourceRow
    - Straight into cWebList or cCJGrid
- Named parameters

# E-SQL SUPPORT
## LANGUAGE & STUDIO FEATURES

- Studio features
  - Syntax Highlighting
  - Code Sense
  - Query Tester
- Language features
  - Multiline string
  - SQL String
  - Include_Text



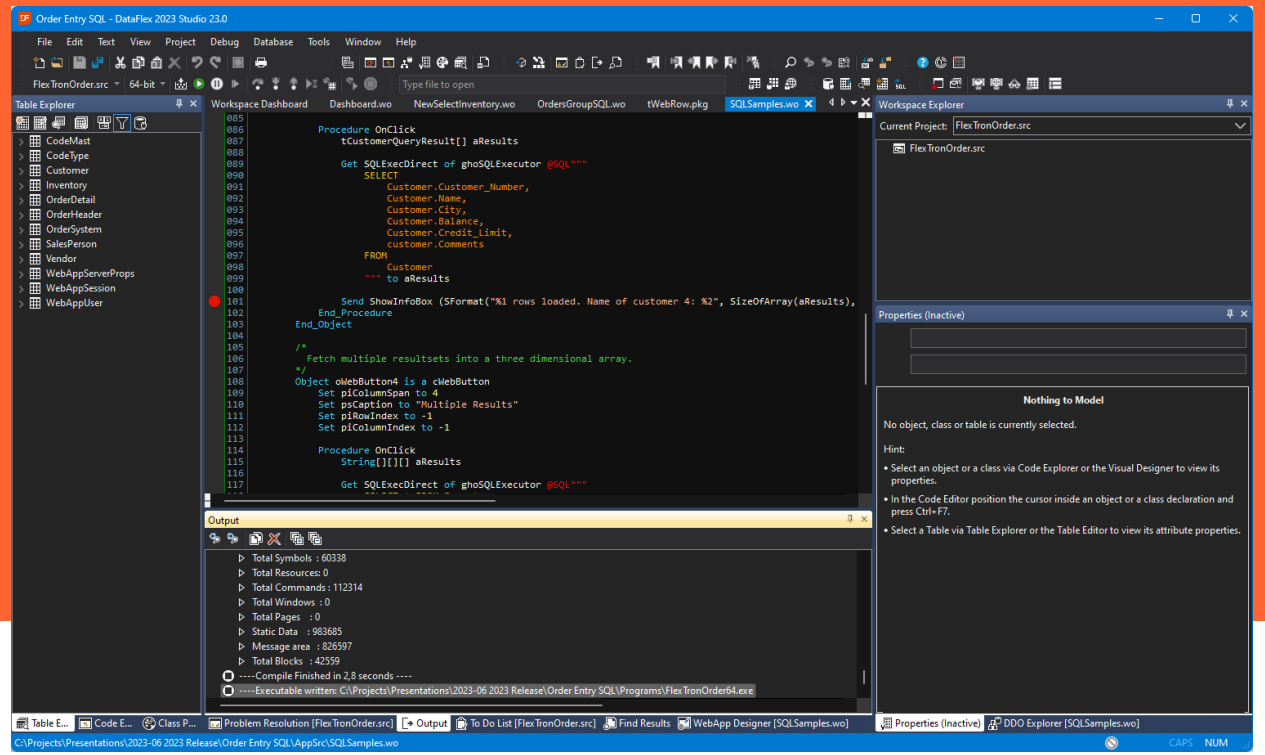
# E-SQL SUPPORT
DEMO..

```
Object oSQLExecutor is a cSQLExecutor
    Set psConnectionId to "SQLDATA"
End_Object

Procedure StringArray
    String[][] aResults

    Get SQLExecDirect of oSQLExecutor @SQL"""
        SELECT
             Name,
             City,
             Zip
         FROM
            Customer
        """ to aResults
End_Procedure

Send StringArray
```

# E-SQL SUPPORT
## USE ITS POWER WISELY

- Not intended to be used for data entry
  - Use data dictionary with business rules!
  - If you are writing an INSERT or UPDATE statement you should reconsider!
- Best used for optimized loading of sets of data

# WHO USES THE STUDIO DARK THEME?



04

# WEBAPP SERVER

# WEBAPP SERVER
# HTTP HANDLER

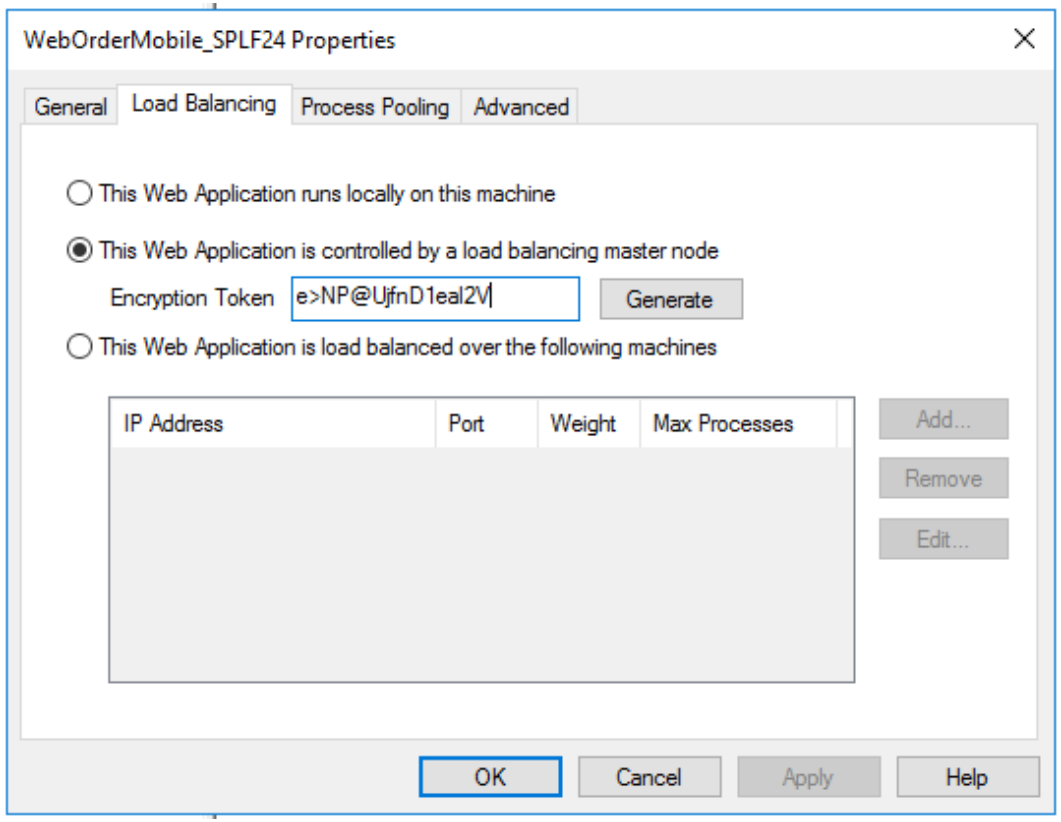
/* NO MORE
CLASSIC ASP*/

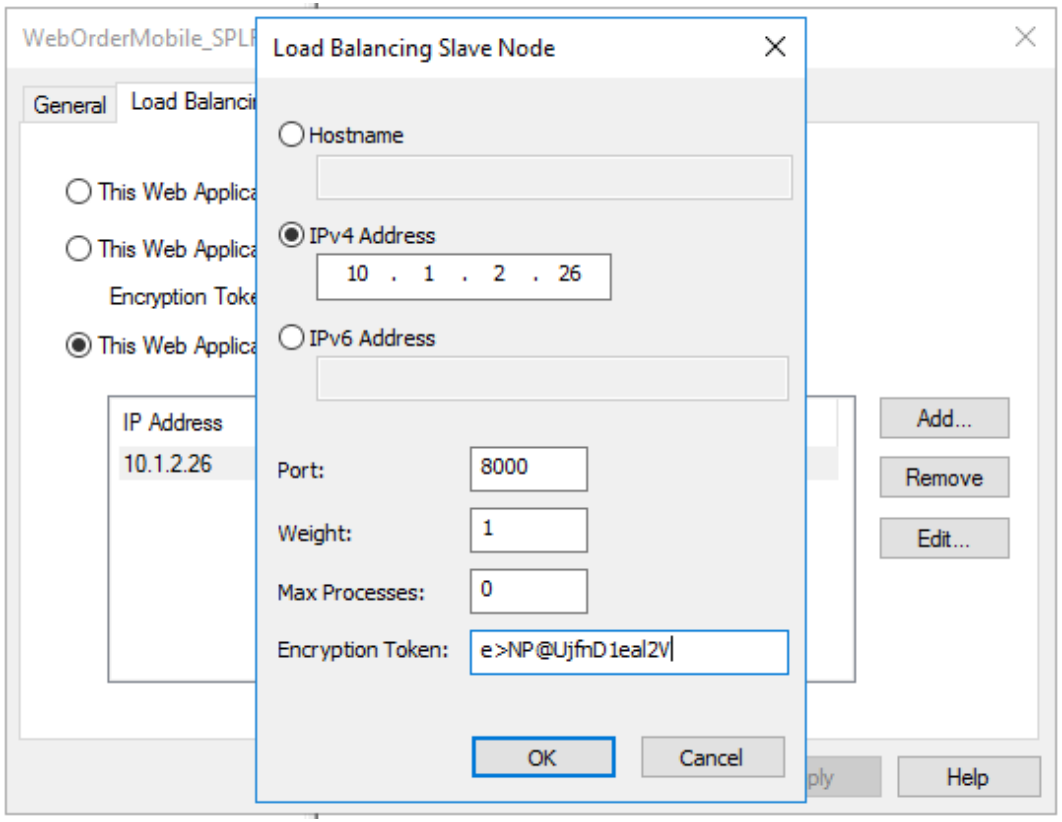
- Full control over HTTP request handling
- Flexible URL handling
- Stream binary data in chunks
- Build powerful REST services

```
Use cWebHttpHandler.pkg

Object oSimpleHTTPHandler is a cWebHttpHandler
    Set psPath to "SimpleHTTP"
    Set psVerbs to "GET"

    Procedure OnHttpGet String sPath String sAcceptType
        Send AddHttpResponseHeader "Content-Type" "text/html"
        Send OutputString """
            <html>
                <head><title>Simple HTTP Demo</title></head>
                <body>
                    <h1>Simple HTTP Demo</h1>
                </body>
            </html>
            """
    End_Procedure
End_Object
```

# WEBAPP SERVER
# SPLF ENCRYPTION

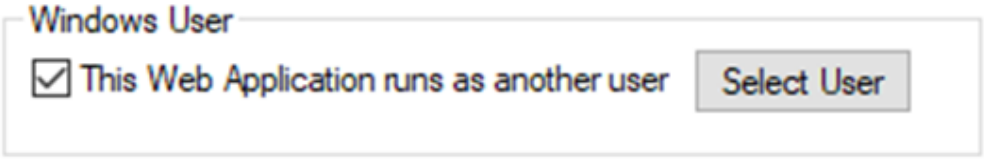
- Encrypted connection between master and application server
- Custom token for increased strenght

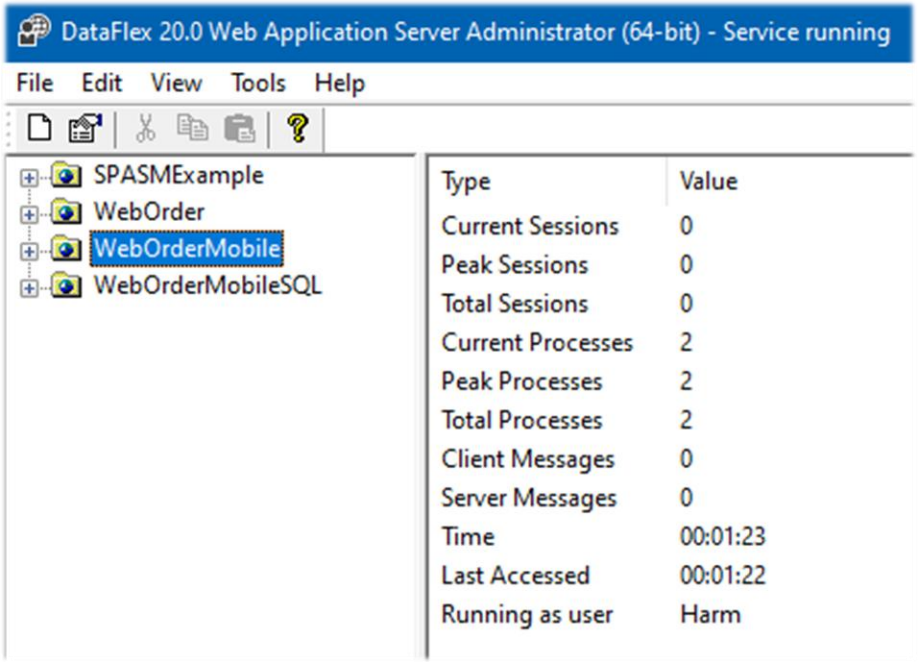


# WEBAPP SERVER
## CONFIGURE WINDOWS USER PER WEBAPP

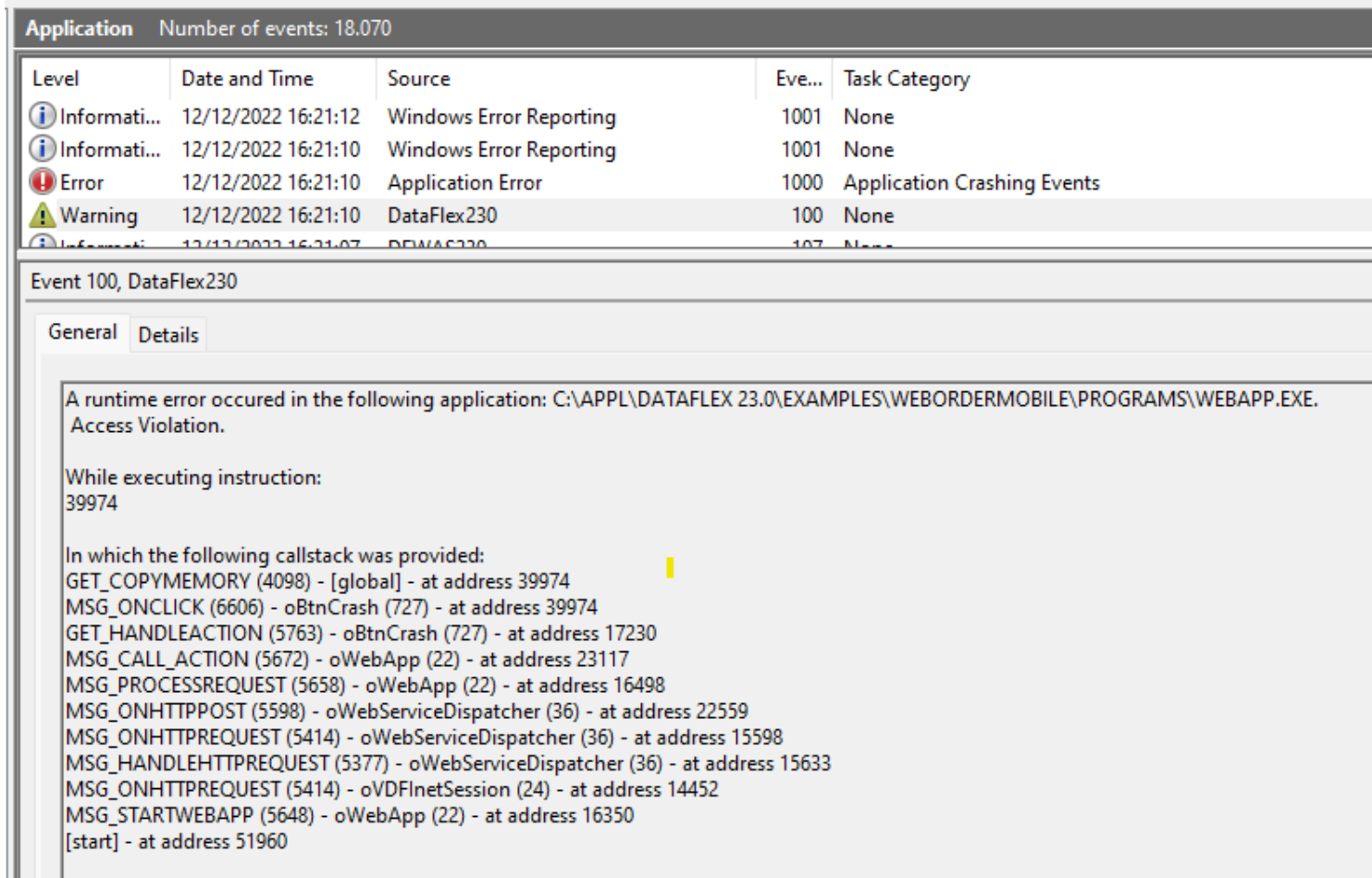
- Run webapp.exe under a different windows user
- Configurable per webapp
- Password securely stored
- Better isolation on shared servers
- Access network



# WEBAPP SERVER
# CRASH DETAILS

- More details on server-side webapp crashes
- DataFlex callstack if possible



# WEBAPP SERVER
## STATISTICS & SMARTER POOL SIZING

- New statistics in the administrator
- Smarter pool resize
- Smarter process connect logic
- Maximum concurrent settings per webapp

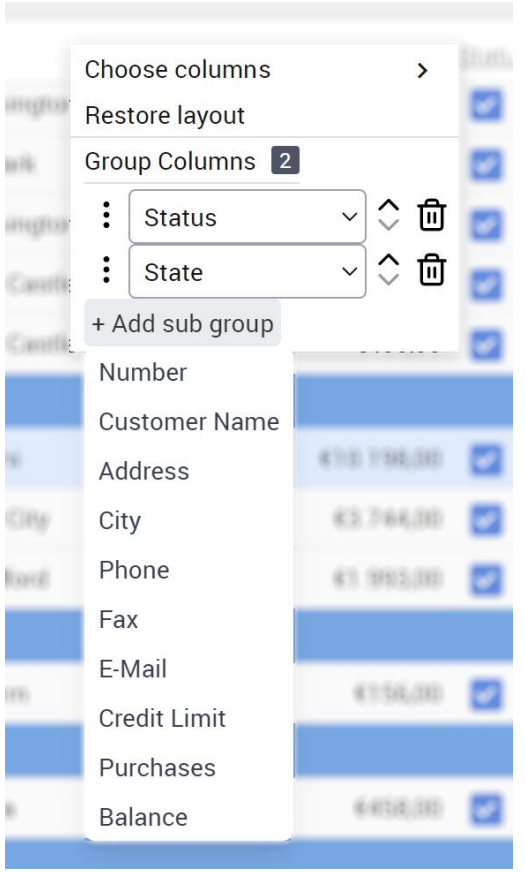
| Type | Value |
|---|---|
| Current Sessions | 0 |
| Peak Sessions | 1 |
| Total Sessions | 2 |
| Current Processes | 2 |
| Peak Processes | 2 |
| Total Processes | 4 |
| Current Load | 0% |
| Peak Load | 0% |
| Client Messages | 21 |
| Server Messages | 16 |
| Average Queue Time | 0 ms |
| Max Queue Time | 0 ms |
| Average Queue Size | 0 |
| Max Queue Size | 0 |
| Average Process Start Time | 536 ms |
| Max Process Start Time | 620 ms |
| Average Response Time | 31 ms |
| Max Response Time | 46 ms |
| Time | 01:49:28 |
| Last Accessed | 00:00:01 |
| Running as user | Default (SYSTEM) |

05

# WEB UI

# WEB UI
# WEBLIST EXTENSIONS

- Customizable layout
  - Rearrange and hide columns
- Footer row
  - Add totals to your list
- Grouping
  - Automatic or custom defined groups
- HTML List
  - HTML box with list capabilities
- Multi select list
  - Subclass with multi select capability

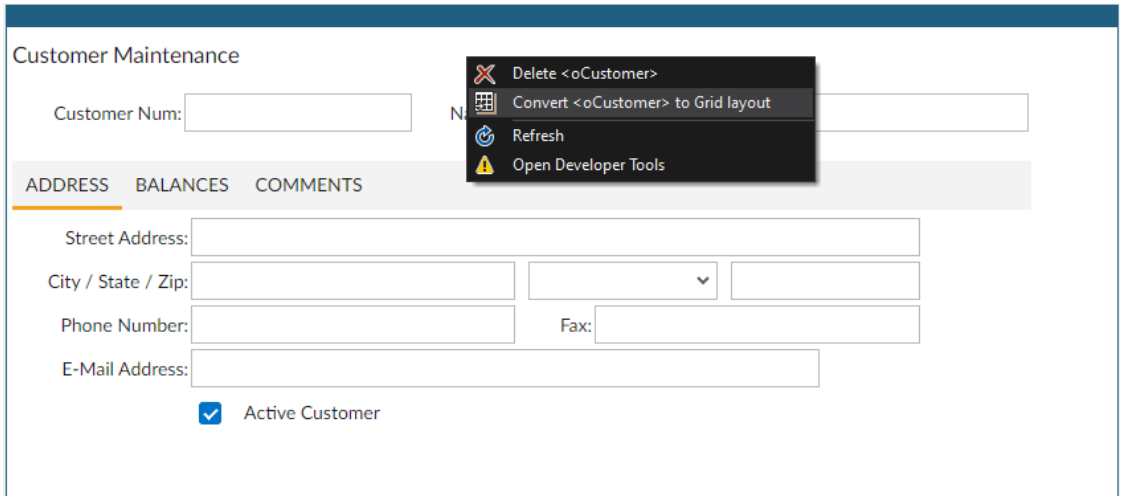


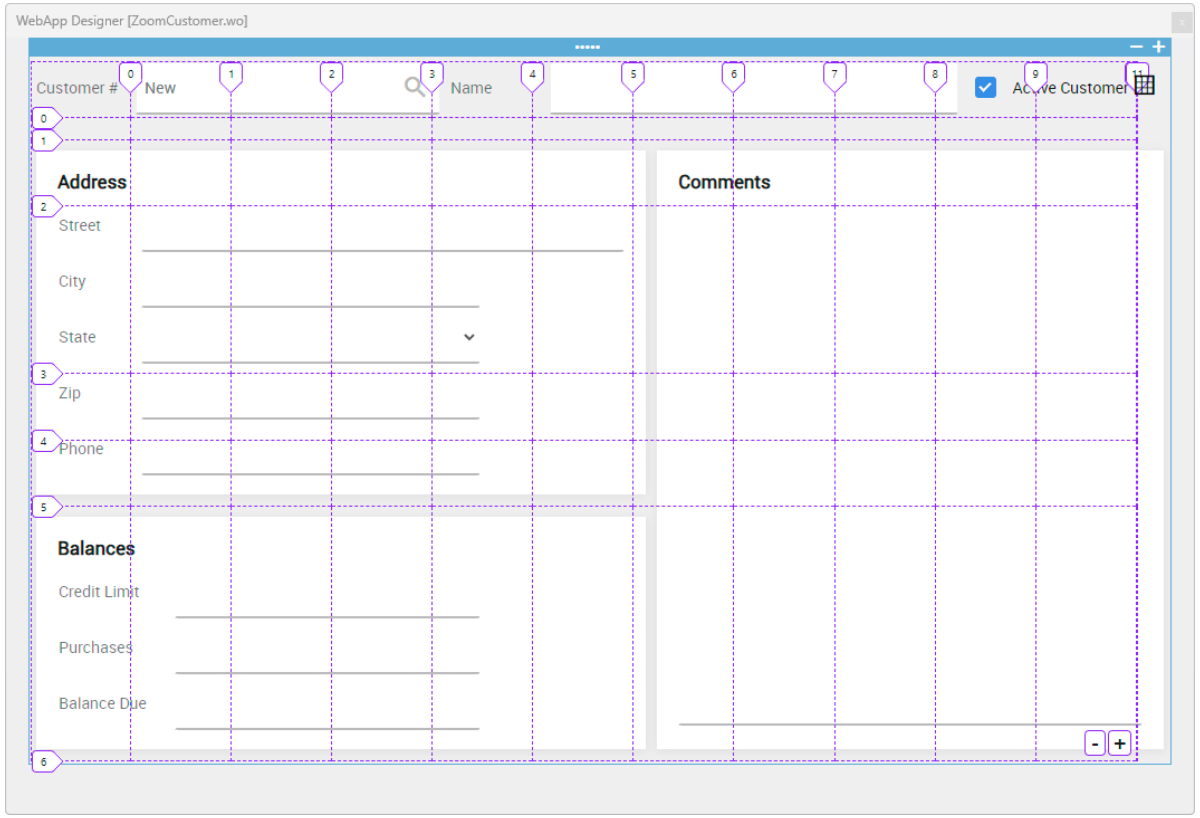
WEB UI
GRID LAYOUT

# /* FULL CONTROL OVER VERTICAL POSITIONING*/

- Introduced in DataFlex 2023, many refinements in DataFlex 2024

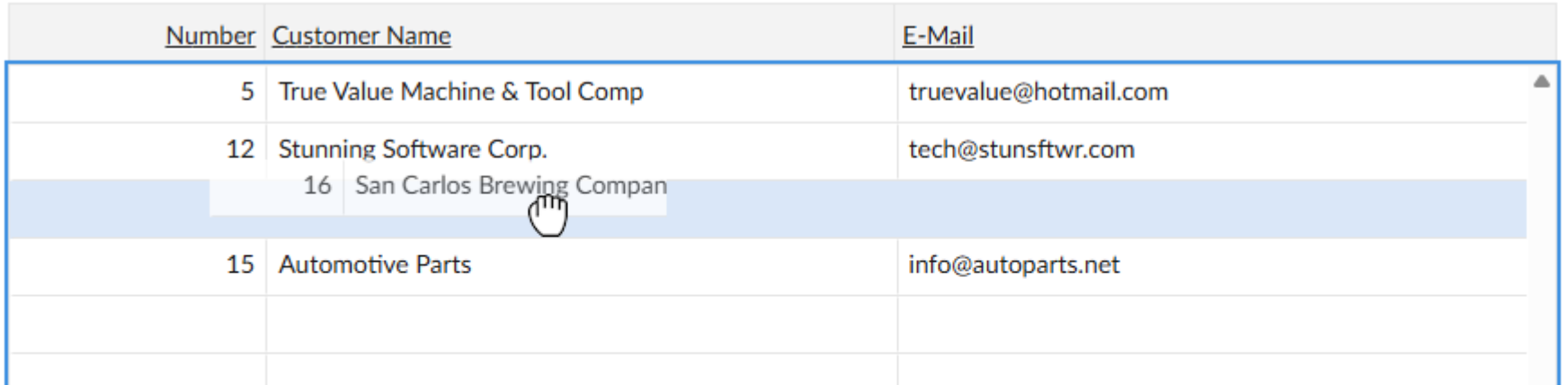
- Provides new options for creating layouts
- Switch between flow and grid layout



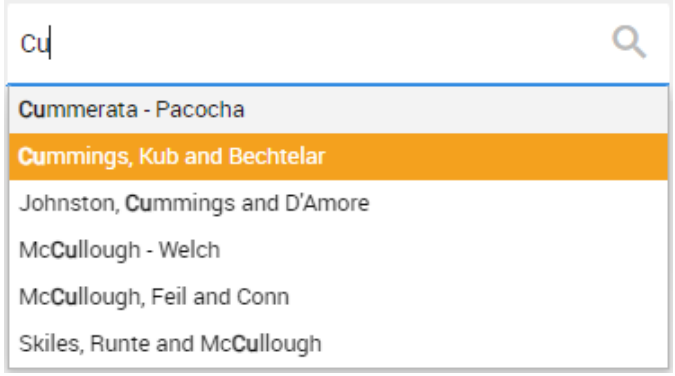
# WEB UI
# DRAG ‘N DROP

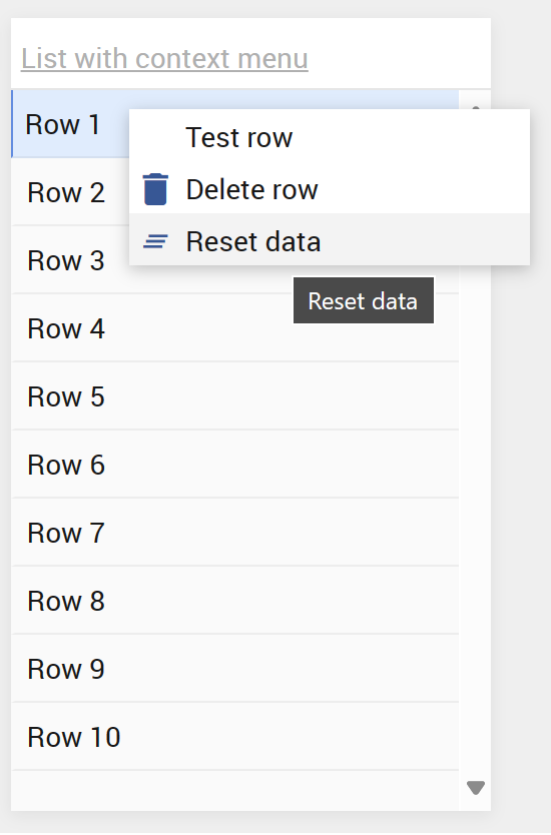
- Single object to control operation
- Drag elements within your application
  - List Rows
  - Treeview Items
  - Tags
  - Files (from outside the browser)
- Drop on
  - Controls
  - Positions within Lists, Treeviews & TagsForms



# WEB UI
# WEB CONTROLS

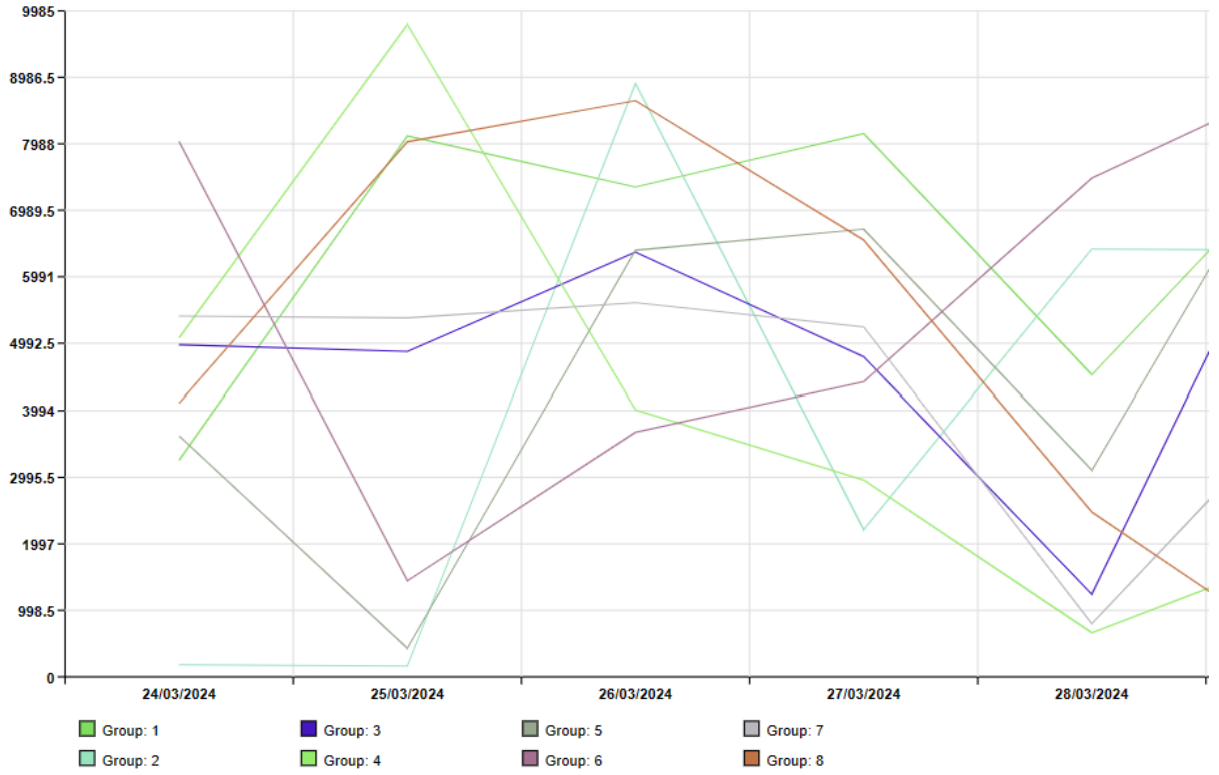
- cWebTagsForm
- cWebSuggestionForm
- cWebContextMenu
  - Use cWebMenuItem or OnDefineMenu
  - Attach to:
    - Controls
    - Browser window
    - List row
    - Tree item
    - Tags





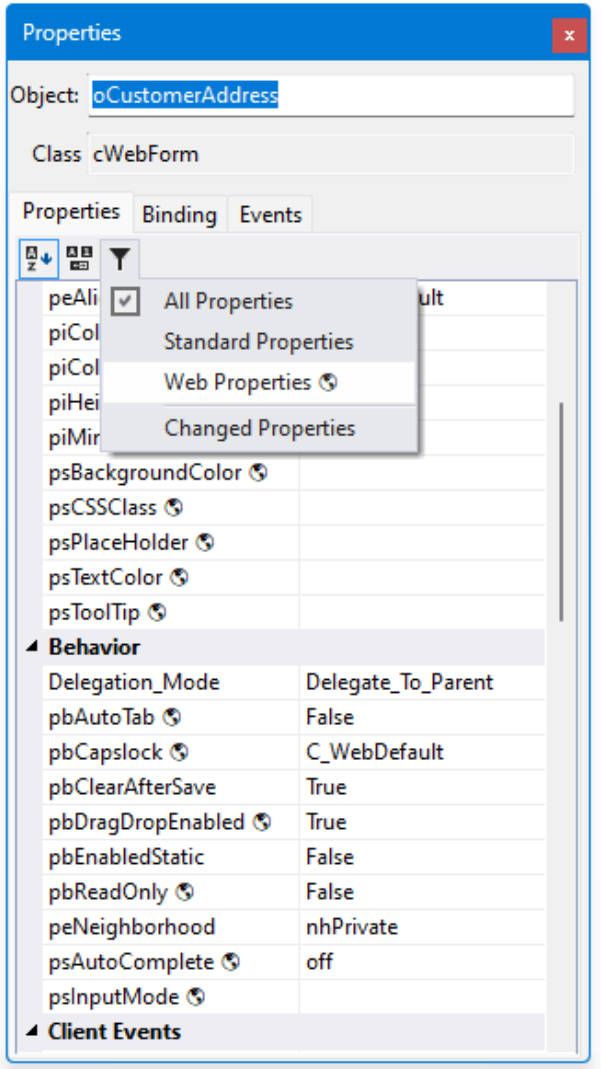
# WEB UI
# VECTOR DRAWINGS

- Create vector drawings from DataFlex code
- User can scale, zoom & pan
- Draw maps, charts, games



# WEB UI
## WEB PROPERTIES IN THE STUDIO

- Filter on web / Windows / changed properties
- Categorized web properties
- Marker indicating web properties



# WEB UI
## DYNAMIC WEB OBJECTS

- Handles dynamic object creation for WebApps
  - Solves the difficulties caused by process pooling
- Use regular webapp API’s
  - Work with real object handles

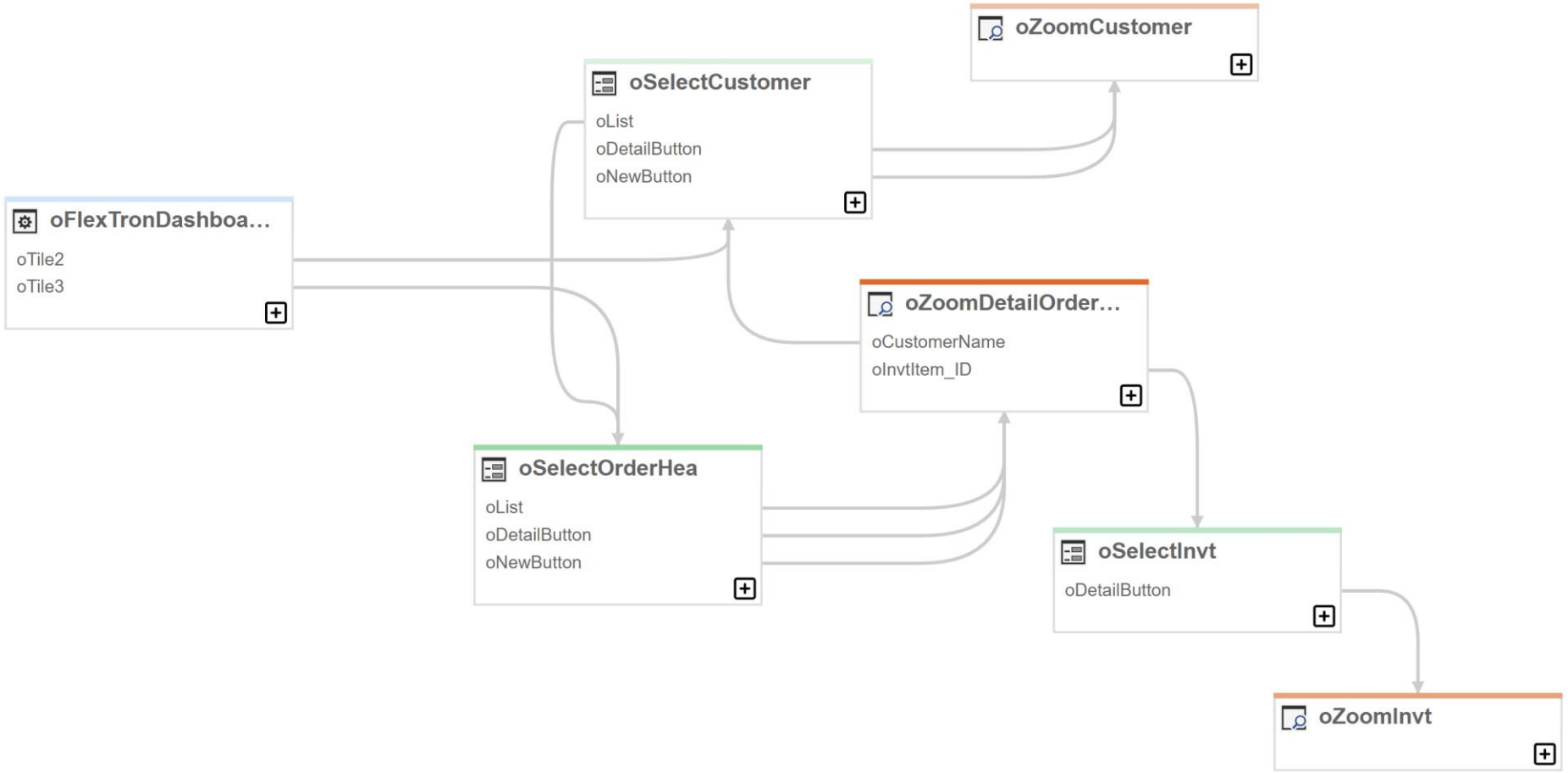
- Support for static child objects since 2024
- Composite class will make this easier with DataFlex 2025

06

# DATAFLEX 2025

# DATAFLEX 2025
# NAVIGATION DESIGNER

- Generate fully functioning drill-down applications without writing code
- Visualize the navigation model of your application



# DATAFLEX 2025
# NAVIGATION DESIGNER

- Visualize your navigation model (also for existing projects)
- Generate views by dragging them from the class palette
- Create navigations by drawing lines between the views
- Configure navigations using the properties panel
- Open web views in full designer mode
- Remove navigations when removing / deleting views

# DATAFLEX 2025
# COMPOSITE CLASS

/* SEE JOHAN BRODDFELT
TOMORROW AT 15:15 */

- Combines nesting syntax of objects with reusability of classes
  - Compose with object syntax
  - Instantiate as a class

- Works elegantly with the dynamic object container
- Full studio support

```
Composite cActionGroup is a cWebGroup
    Set psCaption to "Do something!"

    Property String psMessage "Hello world!"

    Object oDescription is a cWebLabel
        Set psCaption to "This button shows a message box!"
    End_Object

    Object oButton is a cWebButton
        Set psCaption to "Click me!"

        Procedure OnClick
            String sText

            Get psMessage to sText

            Send ShowInfoBox sText
        End_Procedure
    End_Object
End_Composite
```

```
Object oGrpButton is a cActionGroup
    Set psMessage to "DataFlex 2025!"
End_Object
```

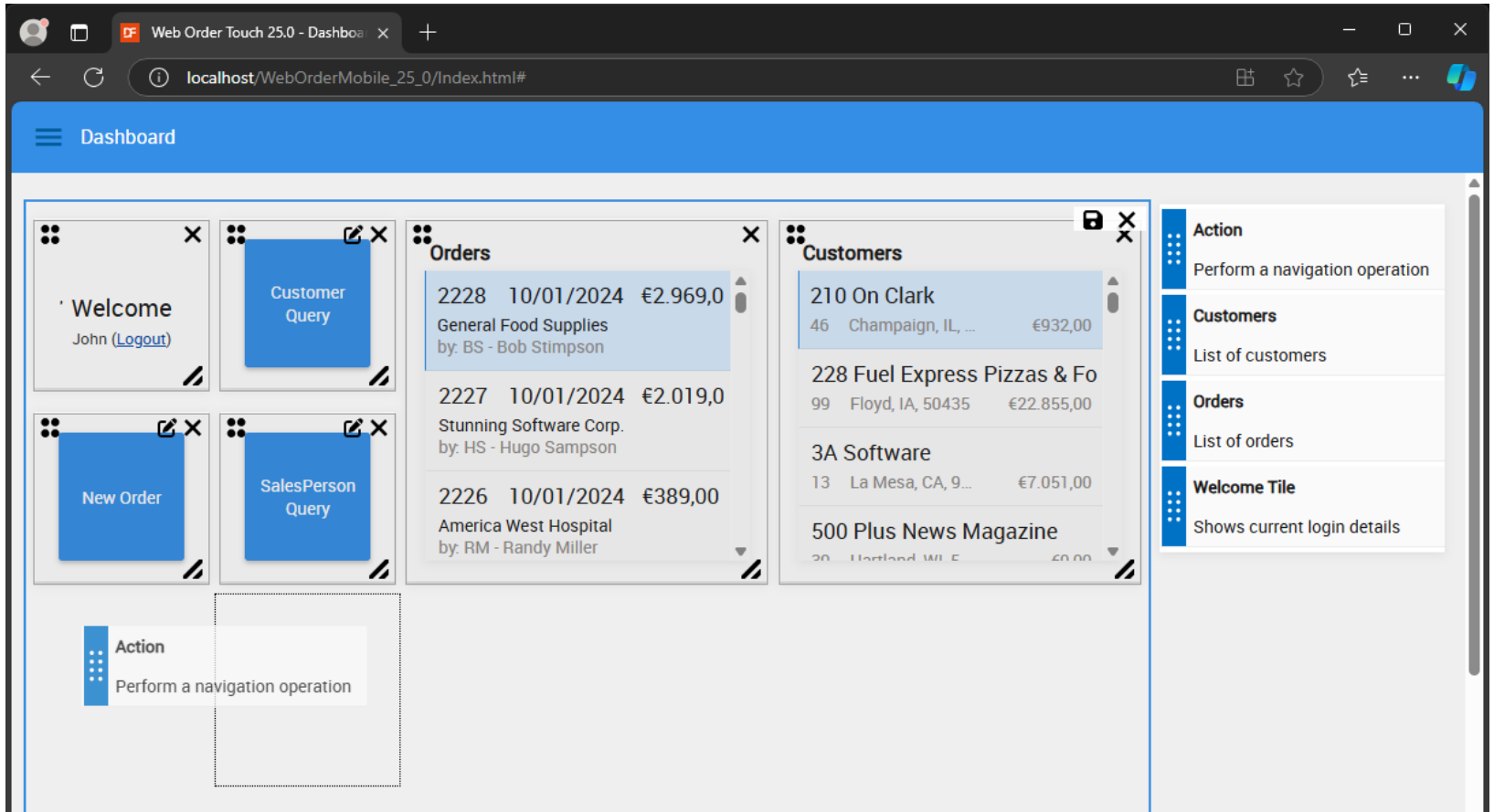
```
Handle hoGroup
Get Create (RefClass(cActionGroup)) to hoGroup
Set psMessage of hoGroup to "DataFlex 2025"
```

DATAFLEX 2025
DYNAMIC DASHBOARDS

/* SEE JOHAN BRODDFELT TOMORROW AT 15:15 */

- Framework for building customizable dashboards
- Design dashboard using drag ‘n drop
- Build your own widgets

- Uses
  - New Composite
  - Dynamic Objects
  - Drag ‘n drop API
  - Grid layout



# DATAFLEX 2025
# ES6 JAVASCRIPT CLASSES

/* SEE NIELS DE BOER TOMORROW AT 9:30 */

- Modernized & Standardized code
- Improved readability and less error prone
- Utilize codesense of modern editors

- Uses
  - ES6 classes
  - Import

DATAFLEX 2025
THEMES NOW USE CSS VARIABLES

/* SEE NIELS DE BOER TOMORROW AT 9:30 */

- Use CSS Variables to customize standard themes
- Set variables from custom CSS
- All styler options are available

```
:root{
    --df-MainDark: #567d2e;
    --df-MainRegular: #7CB342;
    --df-MainMedium: #89ba54;
    --df-MainLight: #a3c97a;
    --df-MainLight2: #cae0b3;
    --df-MainLight3: #e4efd9;
    --df-MainLight4: #f1f7ec;
}
```

# DATAFLEX 2025
# RUNTIME SUPPORT FOR REGULAR EXPRESSIONS

/* SEE MIKE PEAT
TOMORROW AT 14:45 */

- Regular expressions engine in the runtime
- Based on PCRE2 library
  - Perl Compatible Regular Expressions
  - Most popular implementation
- Single class implementation
  - Configure expression using properties
  - Stores compiled expression
    - Compiled on first usage
  - Several Match, Substitute and Split methods

DATAFLEX 2025
REGULAR EXPRESSIONS

/* SEE MIKE PEAT
TOMORROW AT 14:45 */

```
Object oDataSeparator is a cRegEx
    Set psExpression to "[^;,\t ]+"
End_Object

String[] aValues
Get MatchAll of oDataSeparator "John, 2012/06/21, 90kg, Designer" to aValues
```

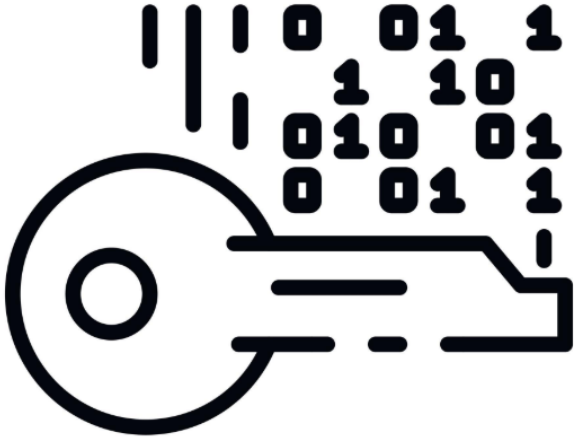
# DATAFLEX 2025
# PASSWORD HASHING

/* SEE BRAM NIJENKAMP
TODAY AT 13:30 */

- cWebSessionManagerStandard now performs password hashing
- cPasswordHasher class encapsulates the logic
- Hashes are stored with a version to support updates of the algorithm

- New projects will have hashed passwords by default
- WebOrder & WebOrderMobile now also use hashed passwords

- Uses PBKDF2 algorithm supported by FIPS and NIST



DATAFLEX 2025
MIGRATE PROJECTS FOR PASSWORD HASHING

/* SEE BRAM NIJENKAMP TODAY AT 13:30 */

- Increase the size of WebAppUser.Password to 128
- Encrypt existing passwords using cPasswordHasher
  - Use business process form the Standard Password Hashing help page

- Or turn off hashing by setting pbPasswordHashing to false

# DATAFLEX 2025
## WHEN?

- Release scheduled for **next week**!

DataFlex

# THANK YOU FOR YOUR TIME!