



DataFlex Entwickler Tag 2019

Converting to DataFlex 2020

Harm Wibier

Levels of migration to 20.0

1. Read the manual!
2. Run your application as 32-bit
 - › *Don't worry about Unicode or 64-bit*
3. Fix Unicode compiler warnings
 - › *This is the difficult step*
4. Convert your application to 64-bit
 - › *All your dependencies need to be 64-bit*
5. Convert your database to a Unicode capable database
 - › *For the preview only MS SQL with Nchar / Nvarchar*

Types of issues running 32-bit

- › Old packages
 - › Types are not supported any more!
 - › Replace them with structs
- › Use OldDfAllEnt.pkg to make things compile
 - › But you'll still have to clean up later!
- › Conversion from pointer to string is now illegal
 - › Use new PointerToString function

Unicode conversion

- › Character conversions
 - › ToOem, ToAnsi now give warnings
 - › Replace with Utf8ToAnsi if necessary
- › External components
 - › Do they support Unicode?
 - › Rewrite to use their Unicode API's
 - › Correct conversions if it only supports ANSI
- › Lots of issues only show at runtime
 - › Sometimes only with special characters

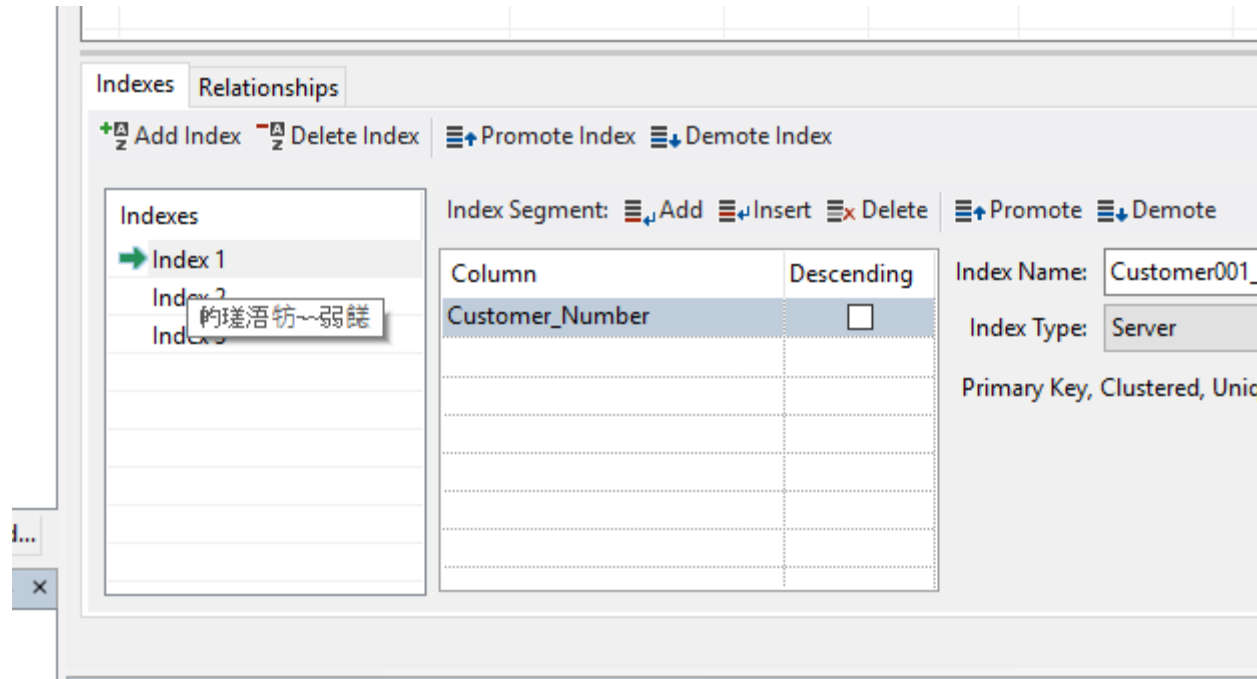
Strings in NextGen

- › Strings and Unicode
 - › In DataFlex strings have been used to manage character strings and bytes of memory
 - › With Unicode this is not the same thing (bytes vs. characters)
 - › Our String function library is extended and modified to handle string byte and character usage
 - › Use UChar arrays for binary (non-string) data!
- › If you are using obsolete string commands, we advise you to switch these to string functions now
- › Check your code for string usage and start identifying places where you are using strings to store binary data

Demo..

› Convert Database Builder 19.0

UTF-8 interpreted as UTF-16



UTF-8 interpreted as ANSI

```
001 #IFSAME Language$Current Language$Francais
002 // cDRReport.Pkg
003 Define C_$DRNoReportIdSpecified      for "Pas d'ID de rapport défini, le rapport n'a pas été ouvert !"
004 Define C_$DRInvalidTablenumberPassed for "Le N° de la table (= %1) passé n'est pas valide"
005 Define C_$DRFunctionNotFound         for "La fonction (%1) n'est pas trouvée"
006 Define C_$DRInvalidSubReportNumberPassed for "N° de sous-rapport passé (= %1) non valide"
007 Define C_$DRCannotLocateTable        for "Impossible de localiser la table %1 dans %2 (n° de table = %3)"
008 Define C_$DRReportOCXNotInitialised   for "L'objet de rapport COM pour (objet='%1') n'est pas créé"
009 Define C_$DRReportZoomFactorRangeExceeded for "L'échelle de facteur de zoom spécifiée (= %1) doit être comprise entre 25 et 500"
010 Define C_$DRNoODBCDatab              C_$DRReportZoomFactorRangeExceeded = "A nagy+♦t+♦si szorz+♦ (= %1) -nak 25 +♦s 500 k+♦z+♦tt kell lenni"
011 Define C_$DRNotTheCorre               C_$DRReportZoomFactorRangeExceeded = "De waarde voor de uitzoom faktor moet liggen tussen 25 en 500"
012 Define C_$DRInvalidPara               C_$DRReportZoomFactorRangeExceeded = "Den oppgitte zoomfaktoren (= %1) må være mellom 25 og 500"
013 Define C_$DRInvalidSort               C_$DRReportZoomFactorRangeExceeded = "Den specificerade zoomfaktorn (= %1) m+♦ste vara mellan 25 och 500"
014 Define C_$DRInvalidColu               C_$DRReportZoomFactorRangeExceeded = "Den angivne zoomfaktor omr+♦de (= %1) skal v+♦re mellem 25 og 500"
015 Define C_$DRNoExportFil               C_$DRReportZoomFactorRangeExceeded = "El rango de zoom especificado (= %1) debe ser entre 25 y 500"
016 Define C_$DRNoValidExpo               C_$DRReportZoomFactorRangeExceeded = "Il fattore di zoom specificato (= %1) deve essere compreso tra 25 e 500"
017 Define C_$DRUnableToPro               C_$DRReportZoomFactorRangeExceeded = "L'échelle de facteur de zoom spécifiée (= %1) doit être comprise entre 25 et 500"
018 Define C_$DRXLSVersionN               C_$DRReportZoomFactorRangeExceeded = "O intervalod de fator de zoom especificado (= %1) deve ser -1 ou -2 ou entre 25 e 500"
019 Define C_$DRXLSNewSheet               C_$DRReportZoomFactorRangeExceeded = "Podany faktor przybli+enia (= %1) musi by-♦ pomi-♦dzy 25 a 500"
020 Define C_$DRXLSIncorrec               C_$DRReportZoomFactorRangeExceeded = "Zadan+♦ rozsah zoom faktoru (= %1) mus+♦ b+♦t mezi 25 a 500"
021 Define C_$DRHTMLExportI               C_$DRReportZoomFactorRangeExceeded = "*****+♦***** (= %1) *****+♦*****+♦***** 25% ♦ 500%"
022 Define C_$DRPDFExportIn               for "Fonction:"
023 Define C_$DRRTFExportIn               for "Rapport:"
024 Define C_$DRReportOCXC                 for "StudioID:"
025 Define C_$DRReportReco
026 Define C_$DRReportForma
027 Define C_$DRReportForma
028 Define C_$DRNoValidPrin
029 Define C_$DRNoExportOpt
030 Define C_$DRErrorInFunc
031 Define C_$DRFunctionName
032 Define C_$DRReportName
033 Define C_$DRFunctionIdentifier
```


Types of issues running 64-bit

- › Illegal data type conversions
 - › Pointer / Address to integer
 - › Handle to integer
 - › *Unfortunately most are runtime errors*
- › Struct padding issues calling external functions components

Integers and Pointers

- › In 64-bit, integers will still be 32-bit
- › Pointers will be 64-bit or 32-Bit depending on platform
- › *You cannot treat Integers and Pointers as interchangeable*
- › You need to review your code and make sure you use Pointer (or Address) when working with memory pointers

LongPtr

- › Integer type the same size as a pointer
 - › 64-bit on 64-bit
 - › 32-bit on 32-bit
- › Can hold pointers
- › Can hold handles

Handles in NextGen

- › Handles are used for DataFlex objects and Window handles
- › Window handles are 64-bit when running 64-bit
 - › So we had to change Handle to become a LongPtr
 - › The extra 32-bit is **almost** never used
 - › So it is usually a 64-bit value in a 32-bit container
 - › *Thanks Microsoft!*
- › Do not use handles for pointers!
 - › A handle is not a memory address!
- › Make sure not to mix integers and handles
 - › Runtime error on overflow
 - › Mixing them as arrays always gives a runtime error

Windows APIs in NextGen

- › You must make sure your API definitions use the correct Windows datatypes
 - › Windows DLL calls (External_Function)
 - › Windows Notifications
 - › Windows Structs
 - › Windows Structs also have different padding rules for 32 and 64 bit application
 - › Examples can be seen in [tWinStructs.pkg](#)
- › If you are using obsolete the Type / End_Type commands and its surrounding commands, we advise you switch over to Structs now
- › If you define additional Windows structs, you will need to double check them
- › You need to change Windows notifications to use the right datatype - that's what LongPtr is for

Structure padding

- › DataFlex does not apply padding
- › C(++) compiler pads structs on the largest type
- › Windows structs have padding

```
Struct tWinChooseFont
    DWord lStructSize
#ifdef IS$WIN64
    Integer iStructAlignment
#endif
    Handle hwndOwner
End_Struct
```

- › 64-bit changes the size of type, and thus influences padding

<https://msdn.microsoft.com/en-us/library/ms253935.aspx>

http://www.catb.org/esr/structure-packing/#_structure_alignment_and_padding

COM components on 64-bit

- › If 64-bit components use the same classid it could work from a single package
- › Generate the code for both the 64-bit and the 32-bit versions
 - › Compare and use `#IFDEF IS$WIN64` for differences
 - › Or generate two packages and `#IFDEF` the include

Demo..

› Convert Order Entry 18.0

Database conversion for Unicode

- › To properly store Unicode
 - › Use MS SQL with Nchar / Nvarchar
 - › *Only tested option in technology preview*
 - › Our recommendation
 - › Use MySQL
 - › Set encoding per field to UTF-8 or UTF-16
 - › Use DB2
 - › Set encoding per database to UTF-8 or UTF-16
 - › Use MS SQL 2019 with UTF-8

DF_TABLE_CHARACTER_FORMAT

- › Table attribute “OEM” / “ANSI”
 - › Will be deprecated
 - › Convert from OEM to ANSI
 - › Without converting to ANSI first conversion to NChar / NVarChar will fail

Provide your feedback

- › Goal of the Technology Preview is to learn the kind of issues you'll run into
- › Post your experiences on the forum
 - › A testing forum will be created..



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Vielen Dank für Ihre Aufmerksamkeit!
Haben Sie Fragen?