



VB API Enhancement for Fasteners



DELMIA BWP Fastener model is exposed through IDL file for usage in Scripting. This enhancement is aimed at enriching the APIs to provide additional capability.

BWP already provides a few APIs to manage now, additional APIs are being provided to handle BWP fasteners.



IDL file: Interface which define APIs which can be used for a given Object for usage in Scripting language

Fastener: Fastener is a mechanical device joining two or more parts to form an assembly

Point Fastener: It is a class of fasteners which are of point type. Spot Weld, Stud Weld are examples.

Curve Fastener: It is a class of fasteners which are of line type. Glue Bead, Arc Weld are examples.



DELMIA BWP workbench provides IDL files for fastener objects so that users can write script utilities to automate repetitive tasks.

Following is a brief description of the IDL interfaces:

DELMIAFastener - Represents a fastener object. It has 2 sub types DELMIAPointFastener and DELMIACurveFastener.

DELMIAPointFastener - Represents a point fastener object.

DELMIACurveFastener - Represents a curve fastener object.

DELMIAFastenerGroup - Represents a fastener group object.

DELMIAFasteners - Represents a collection of fastener objects.

DELMIAFastenerItemServices - It is a utility class to assign and unassign fasteners to and from processes and resources.

DELMIAFastenerWorkBench - It is a utility class to extract all fasteners and fastenergroups from existing workbench.

Following are example use cases:

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[Accessing Properties of Fasteners](#)

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Getting Fasteners and Fastener groups from a workbench

Using Fastener Workbench as a technological object, we can get all the Point or Curve Fasteners or fastener groups available in the process document. We pass an array to the function in which all the fasteners get filled up. The size of array is fixed by getting the number of available fasteners using the function `GetNumberOfPointFasteners`. Here is the example script to get all point fasteners from Workbench:

```
'-----

Language="VBSCRIPT"

Sub CATMain()

    Dim Doc As ProductDocument

    Set Doc = CATIA.ActiveDocument

    Set ItemSelection = CATIA.ActiveDocument.Selection

    '-- Select the Fastener

    Dim InputObjectType(0)

    InputObjectType(0) = "Product"

    Status = ItemSelection.SelectElement2(InputObjectType, "Select the Product", False)

    Set MyProduct = ItemSelection.FindObject("CATIAProduct")

    MsgBox "Selected Product = " & MyProduct.Name

    '--Getting the Workbench

    Dim wb As DELMIAFastenerWorkBench

    Set wb = MyProduct.GetTechnologicalObject("FastenerWorkBench")

    '-- Number of fasteners

    Dim MyNum

    MyNum = wb.GetNumberOfPointFasteners

    MsgBox MyNum

    '--Array Declaration

    Dim MyFastenerList() As AnyObject
```

```

ReDim MyFastenerList(MyNum-1)

'-Getting all the point fasteners

wb.PointFasteners MyFastenerList

For II = 0 to MyNum-1

    MsgBox MyFastenerList(II).Name

Next

End Sub

'-----

```

Getting Fasteners from a Fastener Group

Following is the example script to get fasteners from the selected fastener group. Recursion is used to get all the fasteners (from children also) of the selected group.

```

'-----

'Language="VBSCRIPT"

Dim fastnerCol() As Fastener

Dim TotalCountFastener

Dim GlobalIndex

Sub CATMain()

Dim objProcessDocument As Document

Set objProcessDocument = DELMIA.ActiveDocument

Dim objSelection As Selection

Set objSelection = objProcessDocument.Selection

Dim InputObjectType(0)

```

```

InputObjectType(0) = "FastenerGroup"

Status = objSelection.SelectElement2(InputObjectType, "Select the Fastener Group",
False)

'-----

' You got the fastener group, now recursion for all fasteners

'-----

Dim MyRootFastenerGroup

Set MyRootFastenerGroup = objSelection.FindObject("DELMIAFastenerGroup")

CountAllFastener(MyRootFastenerGroup)

MsgBox "Number of Fasteners = " &TotalCountFastener

ReDim fastnerCol(TotalCountFastener)

GlobalIndex = 0

CollectFasteners MyRootFastenerGroup

End Sub

'-----

Function CollectFasteners (MyFastenerGroup As FastenerGroup)

    NumberOfFasteners = MyFastenerGroup.GetCount("DELMIAFastener")

    if NumberOfFasteners > 0 Then

        Dim NFasteners ()

        ReDim NFasteners (NumberOfFasteners)

```

```

MyFastenerGroup.GetItems "DELMIAPointFastener", NFasteners

For j = 1 To NumberOfFasteners

    Dim FastenerItem As PointFastener

    Set FastenerItem = NFasteners (j-1)

    LocalIndex = GlobalIndex+j-1

    MsgBox "Fastener " &LocalIndex+1& " = " &FastenerItem.Name

    Set fastnerCol(LocalIndex) = FastenerItem

Next

GlobalIndex = GlobalIndex + NumberOfFasteners

End If

NumberOfGroups = MyFastenerGroup.GetCount("DELMIAFastenerGroup")

Dim NGroups ( )

ReDim NGroups (NumberOfGroups)

MyFastenerGroup.GetItems "DELMIAFastenerGroup", NGroups

For i = 1 To NumberOfGroups

    Set Group = NGroups(i-1)

    CollectFasteners Group

Next

End Function

'-----

Function CountAllFastener (MyFastenerGroup As FastenerGroup)

    NumberOfFasteners = MyFastenerGroup.GetCount("DELMIAFastener")

```

```

if NumberOfFasteners > 0 Then

    ThisSize = MyFastenerGroup.GetCount("DELMIAFastener")

    TotalCountFastener = TotalCountFastener + ThisSize

End If


NumberOfGroups = MyFastenerGroup.GetCount("DELMIAFastenerGroup")

Dim NGroups ()

ReDim NGroups (NumberOfGroups)

    MyFastenerGroup.GetItems "DELMIAFastenerGroup", NGroups

For i = 1 To NumberOfGroups

    Set Group = NGroups(i-1)

    CountAllFastener (Group)

Next

End Function

'-----

```

Getting Fasteners from Products

Using FastenerItemServices we get all the fasteners on product(s). Also, there is an option to decide whether the fastener joining the products will be returned or all the fasteners on all the product(s) will be returned. The following script runs for pre-selected product(s).

```

'-----

Language="VBSCRIPT"

Sub CATMain()

    'Definition of a list of types for objects

    Dim listOfTypes(0)

```

```
listOfTypes(0)="Product"
```

```
Dim myDocument
```

```
Set myDocument = CATIA.ActiveDocument
```

```
Dim mySelection As Selection
```

```
Set mySelection = myDocument.Selection
```

```
Dim str As String
```

```
str=mySelection.SelectElement2(listOfTypes,"Select a Product",true)
```

```
Dim number
```

```
number = mySelection.Count
```

```
msgbox "Number of Products selected: " &number
```

```
Dim MyProductList() As AnyObject
```

```
ReDim MyProductList(number-1)
```

```
Dim index As Int
```

```
'Now, we retrieve each object from the selection
```

```
Dim selectedElement As SelectedElement
```

```
for i=0 to number-1
```

```
    index = i+1
```

```
    Set SelectedItem = mySelection.Item(index).Value
```

```
    Set MyProductList(i) = SelectedItem
```

```

        MsgBox SelectedItem.Name

    next

    Set myObject = CATIA.GetItem("DNBFastenerItemServices")

    MsgBox IsArray(MyProductList)

    Dim MyNum

    MyNum = myObject.GetNumberOfFasteners (MyProductList, false)

    MsgBox MyNum

    Dim MyFastenerList() As AnyObject

    ReDim MyFastenerList(MyNum-1)

    myObject.GetFasteners MyProductList,false,MyFastenerList

    for j=0 to MyNum-1

        MsgBox "Fastener " &j+1& " = " &MyFastenerList(j).Name

    next

End Sub

' -----

```

Getting Assigned Processes from a Fastener

Using FastenerItemServices we can get processes to which fastener is assigned. User can get number of assigned processes using NumberOfAssignedProcesses. Each assigned process can be obtained using index as argument. Here is the script to get the process at index 1 (Index starts from 1).

```

' -----

Language="VBSCRIPT"

Sub CATMain()
    Dim Doc As Document
    Set Doc = CATIA.ActiveDocument

    Set ItemSelection = CATIA.ActiveDocument.Selection

    '-- Select the Fastener
    Dim InputObjectType(0)
    InputObjectType(0) = "PointFastener"
    Status = ItemSelection.SelectElement2(InputObjectType, "Select the Fastener", False)
    Set MyFastener = ItemSelection.FindObject("DELMIAPointFastener")
    MsgBox "Selected Fastener = " &MyFastener.Name

```



```

Dim MyActivity As Activity
    Set MyActivity = MyFastener.GetProcess(1)
    MsgBox "Process = " & MyActivity.Name

End Sub

```

'-----

Getting Joining Parts from Fastener and Fastener Group

Using FastenerItemServices we can get parts to which fastener is associated. User can get number of parts using NumberOfJoiningParts. Each part can be obtained using index as argument. Here is the script to get the part from fastener and fastener group at index 1 (Index starts from 1).

Getting part from a fastener at index 1:

```

'-----

Language="VBSCRIPT"

Sub CATMain()
    Dim Doc As Document
    Set Doc = CATIA.ActiveDocument

    Set ItemSelection = CATIA.ActiveDocument.Selection

    '-- Select the Fastener
    Dim InputObjectType(0)
    InputObjectType(0) = "PointFastener"
    Status = ItemSelection.SelectElement2(InputObjectType, "Select the Fastener", False)
    Set MyFastener = ItemSelection.FindObject("DELMIAPointFastener")
    MsgBox "Selected Fastener = " & MyFastener.Name

    Dim MyProduct As Product
    Set MyProduct = MyFastener.GetPart(1)
    MsgBox "Part at index 1 = " & MyProduct.Name

End Sub

```

'-----

Getting part from a fastener group at index 1:

'-----

```

Language="VBSCRIPT"

Sub CATMain()
    Dim Doc As Document
    Set Doc = CATIA.ActiveDocument

    Set ItemSelection = CATIA.ActiveDocument.Selection

    '-- Select the Activity
    Dim InputObjectType(0)

```

```

InputObjectType(0) = "FastenerGroup"
Status = ItemSelection.SelectElement2(InputObjectType, "Select the Fastener Group",
False)
Set MyFastenerGroup = ItemSelection.FindObject("DELMIAFastenerGroup")
Msgbox "Selected Group = " & MyFastenerGroup.Name

```

```

Dim MyProduct As Product

```

```

Set MyProduct = MyFastenerGroup.GetPart(1)

```

```

Msgbox "Part at Index 1 = " & MyProduct.Name

```

```

End Sub

```

```

'-----

```

Getting Part Load Status from DPE for Fasteners

All the joining parts of a fastener may not be loaded to V5 document from DELMIA Process Engineer. AllPartsLoaded API returns this load status of parts for fastener.

```

'-----

```

```

Language="VBSCRIPT"

```

```

Sub CATMain()

```

```

    Dim Doc As Document

```

```

    Set Doc = CATIA.ActiveDocument

```

```

    Set ItemSelection = CATIA.ActiveDocument.Selection

```

```

    '-- Select the Fastener

```

```

    Dim InputObjectType(0)

```

```

    InputObjectType(0) = "PointFastener"

```

```

    Status = ItemSelection.SelectElement2(InputObjectType, "Select the Fastener",
False)

```

```

    Set MyFastener = ItemSelection.FindObject("DELMIAFastener")

```

```

    Msgbox "Selected Fastener = " & MyFastener.Name

```

```

    Dim AllPartsLoaded

```

```

    AllPartsLoaded = MyFastener.AllPartsLoaded

```

```

    If (AllPartsLoaded = 0) Then

```

```

        MsgBox "ALL PARTS LOADED STATUS = FALSE"

```

```

    Else

```

```

        MsgBox " ALL PARTS LOADED STATUS = TRUE"

```

```

    End If

```

```

End Sub

```

```

'-----

```

Getting DPE Defined User Attributes from a Fastener

Following script is for the case where user has created in E5 a new user defined attribute, for spotweld planttype ,of string type, named "Fastener Eng Type" and its value is set as geospot. Then project is loaded in V5 and then the script is executed.

```
'-----  
  
Language="VBSCRIPT"  
  
Sub CATMain()  
  
    Dim Doc As Document  
  
    Set Doc = CATIA.ActiveDocument  
  
    Set ItemSelection = CATIA.ActiveDocument.Selection  
  
    '-- Select the Fastener  
  
    Dim InputObjectType(0)  
  
    InputObjectType(0) = "PointFastener"  
  
    Status = ItemSelection.SelectElement2(InputObjectType, "Select the Fastener", False)  
  
    Set MyFastener = ItemSelection.FindObject("DELMIAPointFastener")  
  
    MsgBox "Selected Fastener = " & MyFastener.Name  
  
    Dim StrAttrVal As String  
  
    StrAttrVal = MyFastener.GetStringUserAttribute ("Fastener Eng Type")  
  
    MsgBox "Fastener Eng Type = " & StrAttrVal  
  
End Sub  
  
'-----
```

Making Fastener ID Visible in 3D Viewer

Using SetTextIDVisiblty function the text ID of the fastener is shown in the 3D window. If input to the function is true/1 then ID is visible and if it is false or 0 then it hides the ID.

Here is the script:

```
'-----  
  
Language="VBSCRIPT"  
  
Sub CATMain()  
    Dim Doc As Document  
    Set Doc = CATIA.ActiveDocument  
  
    Set ItemSelection = CATIA.ActiveDocument.Selection  
  
    '-- Select the Fastener  
    Dim InputObjectType(0)  
    InputObjectType(0) = "PointFastener"  
    Status = ItemSelection.SelectElement2(InputObjectType, "Select the Fastener", False)  
    Set MyFastener = ItemSelection.FindObject("DELMIAPointFastener")  
  
    MsgBox "Selected Fastener = " & MyFastener.Name  
  
    '--Making Fastener ID visible  
  
    MyFastener.SetTextIDVisibility(1)  
  
End Sub  
  
'-----
```

