

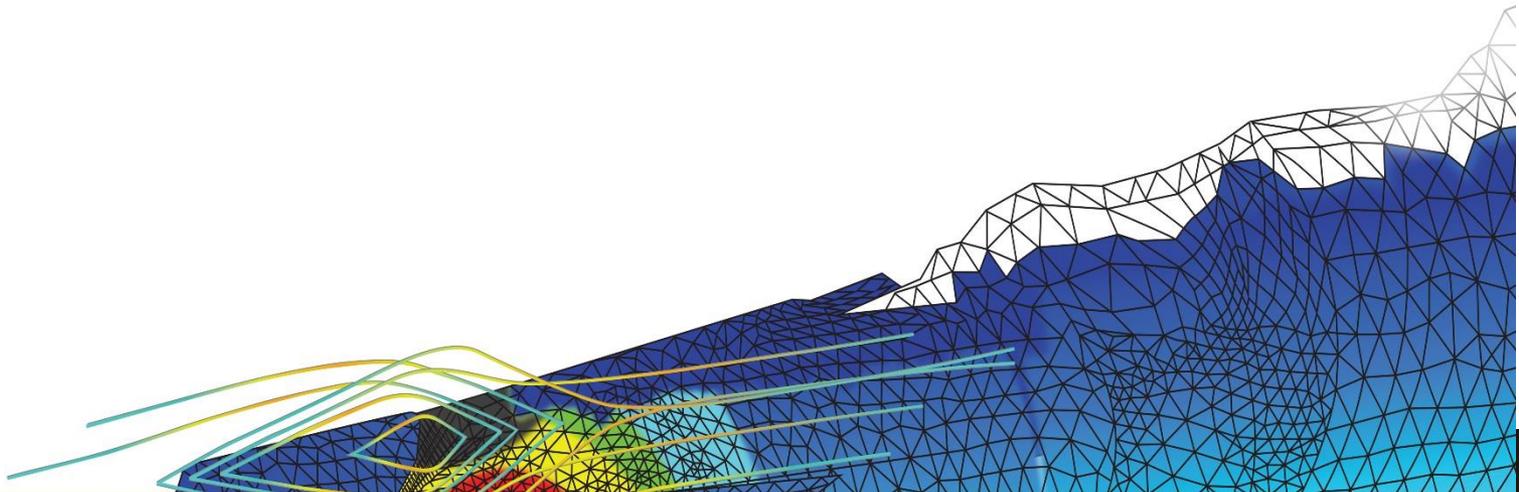
Realize Your Product Promise®

17.0 Release

ANSYS®

External CAD Bridge Version 1

chris.butor@ansys.com



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External CAD Bridge - Overview



- **Name of the app** : External CAD Bridge
- **Target application** : Project Schematic
- **Description** : Demonstrate how to create an application that integrates parametric study for non-ANSYS CAD Modeling programs

The version of the App and the supported versions of ANSYS are the ones indicated on the App Store.

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ACT App Store



- https://support.ansys.com/AnsysCustomerPortal/en_us/Downloads/Application+Library
- **Great place to get started**
 - A library of helpful extensions available to any ANSYS customer
 - New extensions added regularly
 - Applications made available in either binary format (.wbex file) or binary plus scripted format (Python and XML files)
 - Scripted extensions are great examples
 - Links to customization documentation and training material

Information



- Please pay attention to paragraph 9 of the **CLICKWRAP SOFTWARE LICENSE AGREEMENT FOR ACS EXTENSIONS** regarding **TECHNICAL ENHANCEMENTS AND CUSTOMER SUPPORT (TECS)**: “TECS is not included with the Program(s)”

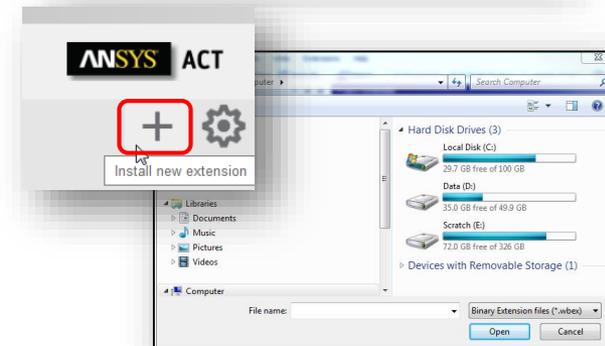
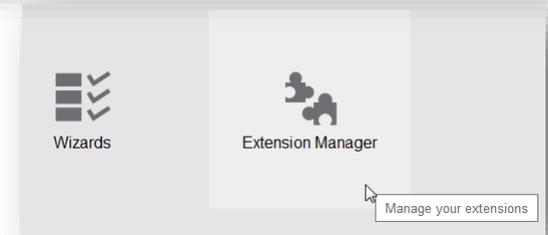
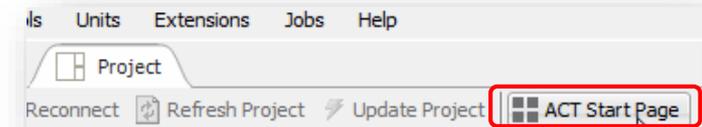
- Report any issue or provide feedback related to this app please contact:

Contact email address: chris.butor@ansys.com

Binary App Installation (1)

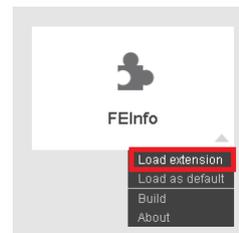
Installing from the ACT Start Page:

1. From the project page, select the “*ACT Start Page*” option
2. Click on “Extension Manager”
3. Press “+” symbol in the top right corner
4. It will open a file dialog to select the appropriate “*.wbex” binary file
5. The extension is installed



Loading the extension:

1. From the Extension Manager, click on your extension and choose ‘Load Extension’
2. The extension is loaded



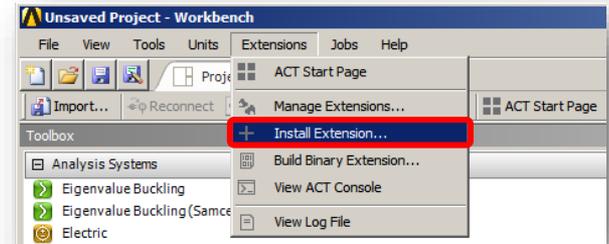
Notes:

- The extension to be installed will be stored in the following location: %AppData%\Ansys\v170\ACT\extensions
- The installation will create a folder in this location, in addition to the .wbex file

Binary App Installation (2)

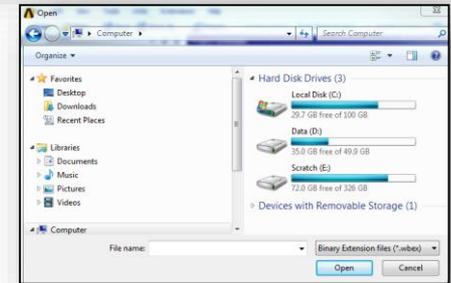
Installing from the Extensions menu:

1. From the Extensions menu, select the “*Install Extension...*” option
2. It will open a file dialog to select the appropriate “**.wbex*” binary file
3. Click “*Open*” to install the extension



Loading the extension:

1. From the Extension Manager, click on your extension and choose ‘Load Extension’
2. The extension is loaded

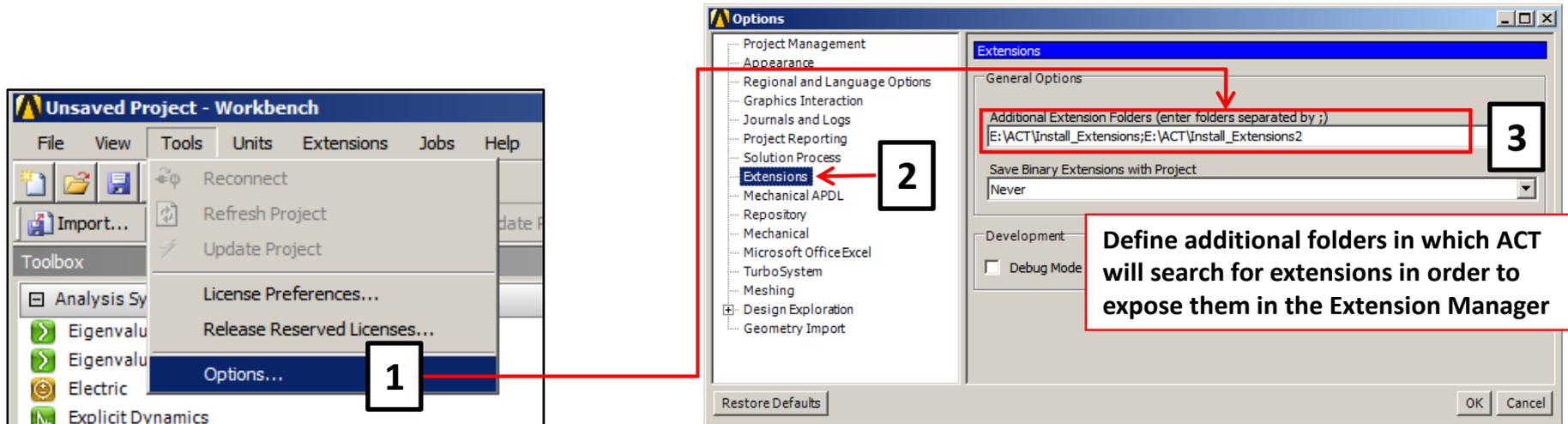


Notes:

- The extension to be installed will be stored in the following location: %AppData%\Ansys\v170\ACT\extensions
- The installation will create a folder in this location, in addition to the .wbex file

Binary App Installation (3)

- Once the binary extension is installed at default location, one can move the *.wbex and the folder to any other location
 - Default path: `%AppData%\Ansys\v170\ACT\extensions`
 - New path: Any location on your machine, shared drive etc.
- All users interested in using the extension need to include that path in their Workbench Options
 1. In the **“Tools”** menu, select the **“Options...”**
 2. Select **“Extensions”** in the pop up panel
 3. Add the path under **“Additional Extensions Folder ...”**

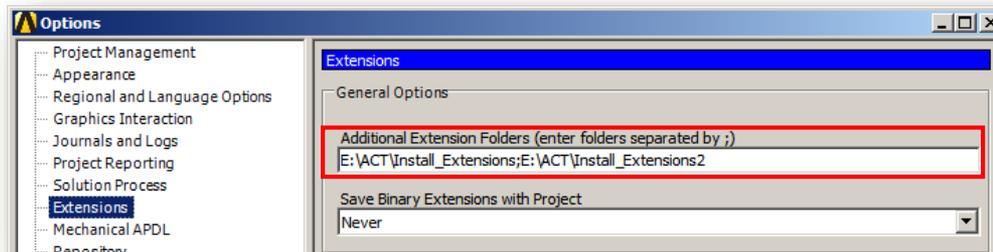


Notes:

- During the scan of the available extensions, the folders will be analyzed according to the following order:
 1. The application data folder (e.g. `%AppData%\Ansys\v170\ACT\extensions`)
 2. The additional folders defined in the “Additional Extension Folders” property
 3. The installation folder
 4. The “extensions” folder part of the current Workbench project (if the project was previously saved with the extension)
- If an extension is available in more than one of these locations, the 1st one according to the scan order is used

Scripted App Installation (source code)

- Paste the XML file and the corresponding folder on your computer. You can paste them either:
 - In the default path: *%AppData%\Ansys\v170\ACT\extensions*
 - In a user defined path: any location on your machine, shared drive etc.
- If the files are located in the default path, the extension is automatically available in the Extension Manager
- If the files are in a user defined path, it is required to define the “Additional Extension Folder” under Workbench menu (Tools → Options...) to make it available in the Extension Manager:



Documentation (details 1)

This extension demonstrates how to use ACT workflows to leverage parametric study based on CAD geometry from a non-ANSYS modelling software (internal program/application that generates a CAD model; or any commercially produced CAD modelling software like CREO, NX, CATIA, Solidworks, Autodesk).

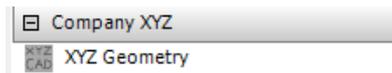
In this extension, the application launches a journal in Workbench which creates a washer in Design Modeler. The inner diameter of the washer is an input parameter for parameter set.

Note: Source code is shared with this application; the user can modify it to introduce his own CAD modelling software to engage parametric study in Workbench. Instead of running Workbench with a journal, the user would execute their CAD software.

Documentation (details 2)

- **Important** : Open
%AWP_ROOT170%\Addins\ACT\bin\Win64\TransferTypeDirectPropertyAccessList.xml
Add <TransferType>FEMSetup</TransferType>

- Insert a XYZ Geometry System

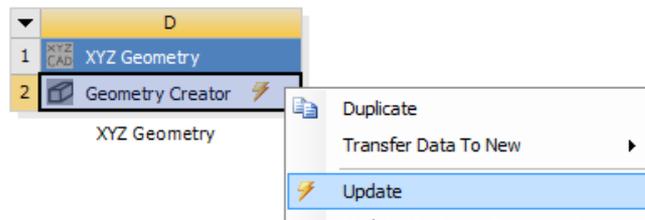


- Set inner diameter value

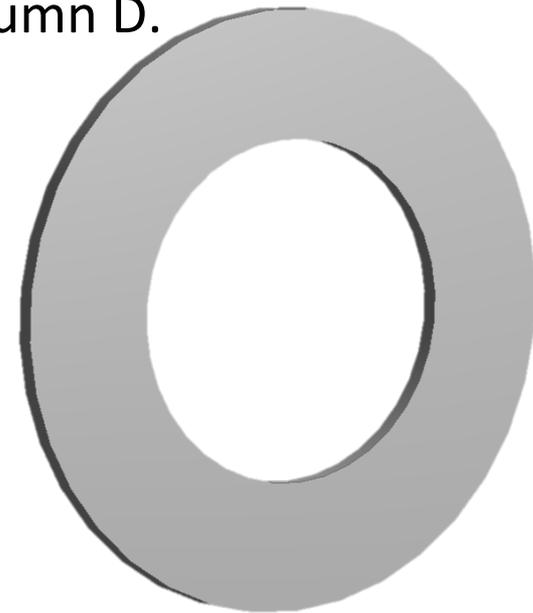


- For a parametric study, tick the box in column D.

- Update

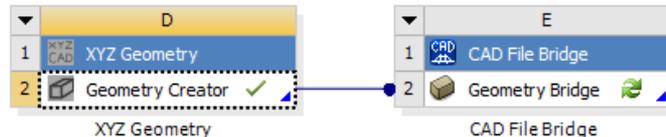


- The washer is created

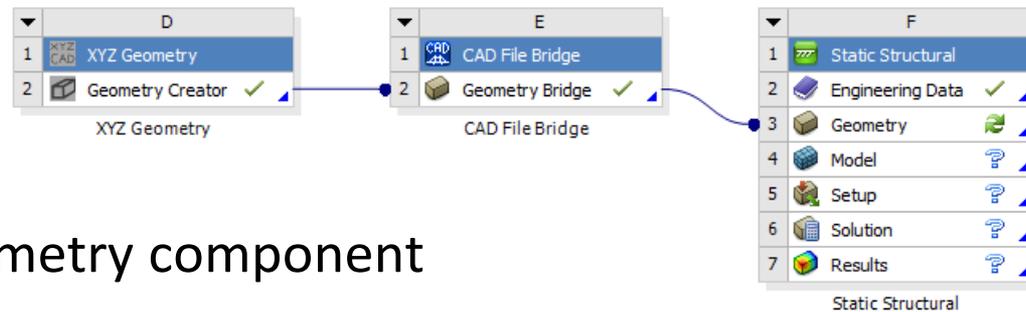


Documentation (details 3)

- Link XYZ Geometry System to a new CAD File Bridge system



- Update Geometry Bridge task
- Link it to a Geometry in a Static Structural System, or in any Mechanical System



- Update Geometry component
- Define your model and start a parametric study

	A	B	C	D	E	F
1	Name	Update Order	P2 - InnerDiameter	P1 - Equivalent Stress Maximum	<input type="checkbox"/> Retain	Retained Data
2	Units		mm	Pa		
3	DP 0 (Current)	1	20	1602.5	<input checked="" type="checkbox"/>	✓
4	DP 1	2	10	1370.3	<input checked="" type="checkbox"/>	✓

Documentation (details 4)

Integrating external CAD designer

From Source Code (src folder) :

- In XML file ExternalCADBridge.xml new parameters for your geometry can be defined in the `propertygroup` : `Inputs`
- In order to integrate your CAD designer open python file `CADGenerator.py`
 - In function `updateGeometry`, `softwareDir` defines the path to the software to be used.
 - In the function `buildjournal` you can refer to a scripting file that defines the geometry. The parameters for geometry are changed here.

Thank you

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