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BOXER Tutorial:

Sketching Primitives

BOXER version 3.10.0

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Sketching primitives

In this tutorial we use sketching primitives to repair and augment an existing geometry. The primitive sketching entities are then converted to 'real' geometry and a mesh is created.

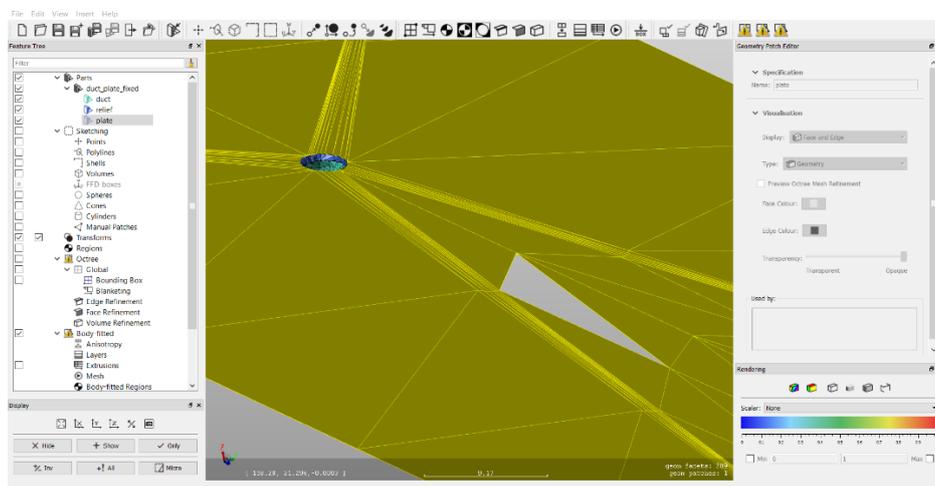
This tutorial assumes that the user is familiar with the general method of the BOXERmesh GUI, and the operation of the various specifier panels. If this is not the case then please review beginner tutorial.

Import the geometry from a *.btf file duct_plate.btf

- File > Import Part from the menu bar, OR
- Click the Import Part toolbar button, OR
- Use the keyboard shortcut Ctrl-G

The geometry is imported as a single part containing three patches.

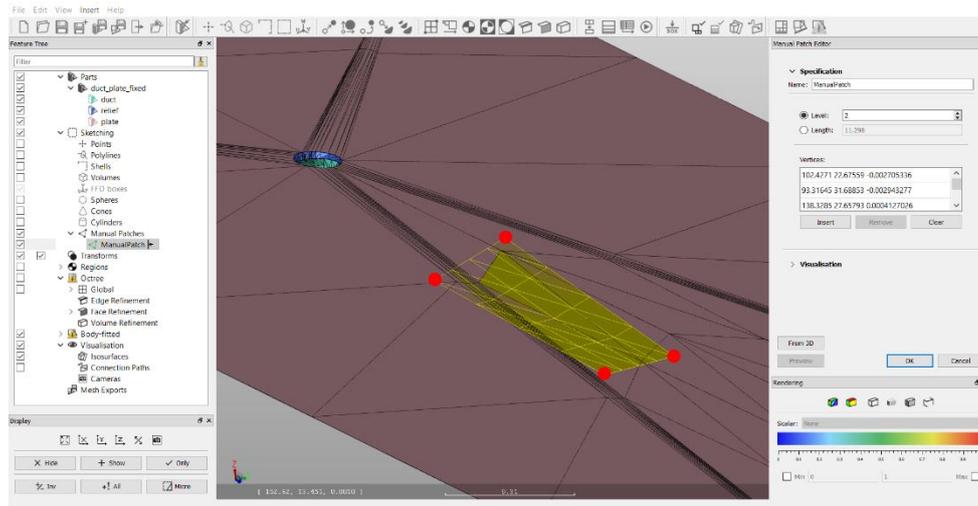
Upon inspection there is a missing facet in the 'plate' patch. This gap must be repaired before meshing can take place.



Insert a Manual Patch to fix the gap

From the menu bar, select `Inset > Manual Patch`, the Manual Patch Editor appears

Clear the default list of vertices from the vertex list by pressing the 'Clear' button. Use the 'From 3D' function to select 4 new vertices for the patch. These vertices do not have to co-incide with existing vertices on the geometry.



Press the 'OK' button to confirm the creation of the patch.

Create Geometry from the Manual Patch

Primitive sketching entities are not 'seen' as physical geometry by BOXERmesh. In order to seal the hole, a new geometric patch must be created from the manual patch.

Right-click on the newly created manual patch called ManualPatch and select "Create patch from sketching" from the context menu. A new geometry patch appears in the parts list called "Manual Patches/ManualPatch". You can rename this in the normal way (right click > Rename) if desired.

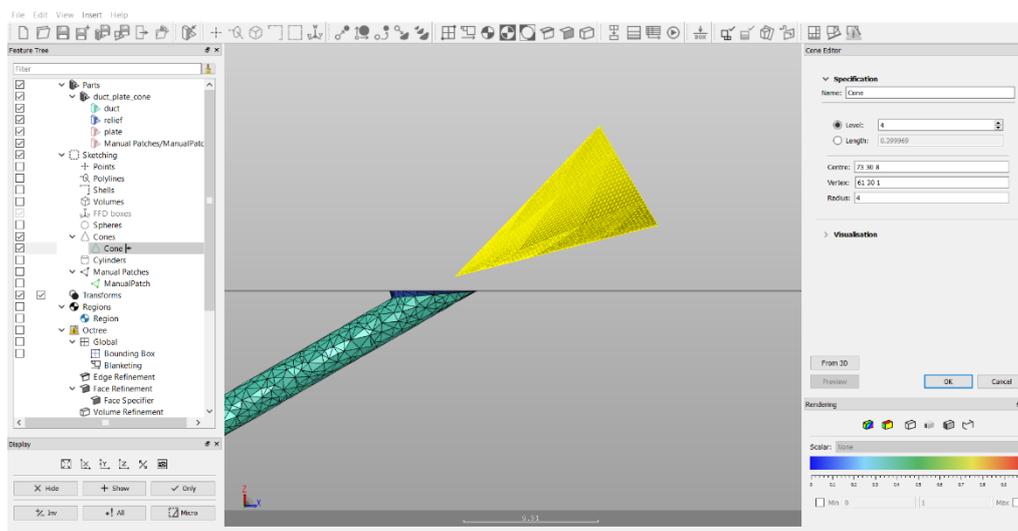
Create a Cone and cylinder

Select Inset > Cone from the menu bar. The Cone Editor dialog box appears

Create a cone

- a triangulation level 4
- with a centre at (73, 30, 8)
- a vertex at (61, 30, 1)
- a radius of 4

Press OK to confirm the selection. A cone called "Cone" appears in the Sketching branch of the Feature Tree

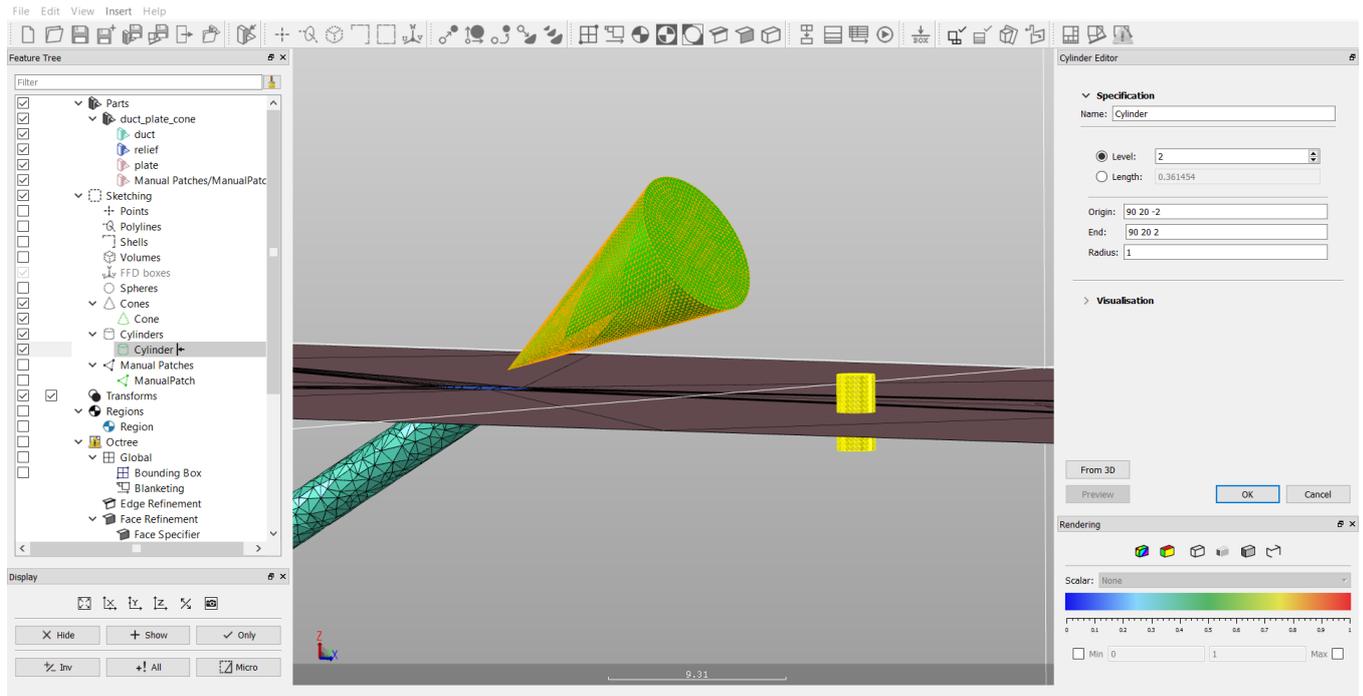


Select **Inset > Cylinder** from the menu bar. The Cylinder Editor dialog box appears.

Create a cone

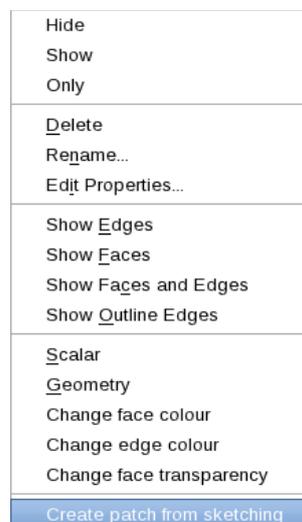
- a triangulation level 2
- with an Origin at (90, 20, -2)
- an End at (90, 20, 2)
- a radius of 1

This creates a cylinder downstream of the duct and a little to one side and a cylinder called “Cylinder” appears in the Sketching branch of the Feature Tree



Create Geometry from the Sketching Entities

Right click on the cone called “Cone” in the Sketching branch of the feature tree. From the context menu select “Create patch from sketching”



A new geometric patch called “Cones/Cone” appears in the Parts list. Do the same for the cylinder called “Cylinder” to create a new geometric patch called “Cylinders/Cylinder”.

Now either of these patches can be renamed or added to an existing geometric patch in the normal way.

Create a straightforward mesh in the domain. Note that the created geometry patches take a full, normal part in the calculation of the domain.

