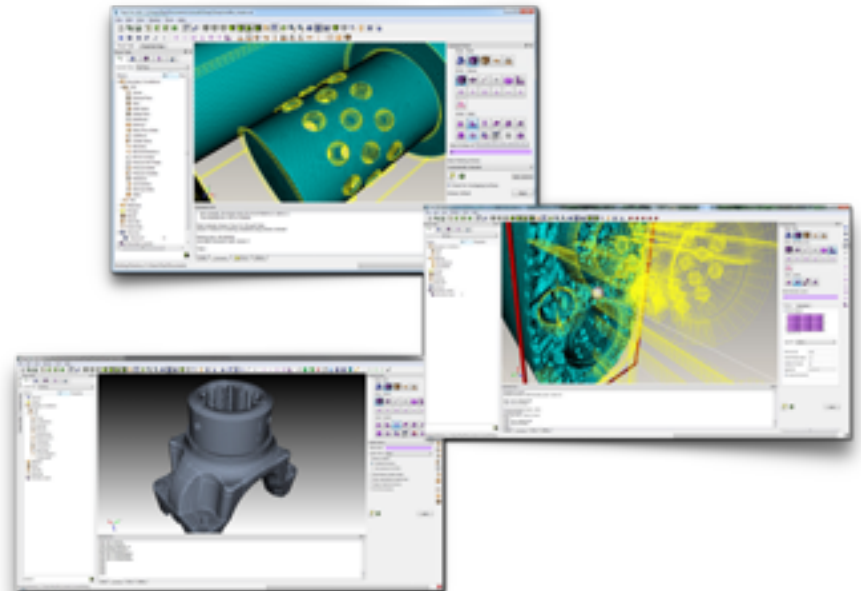
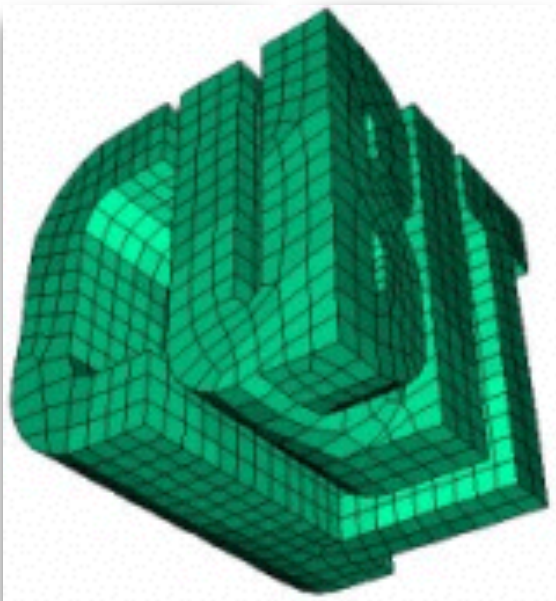
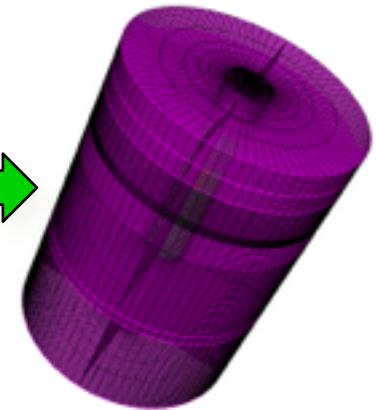
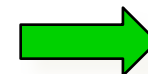
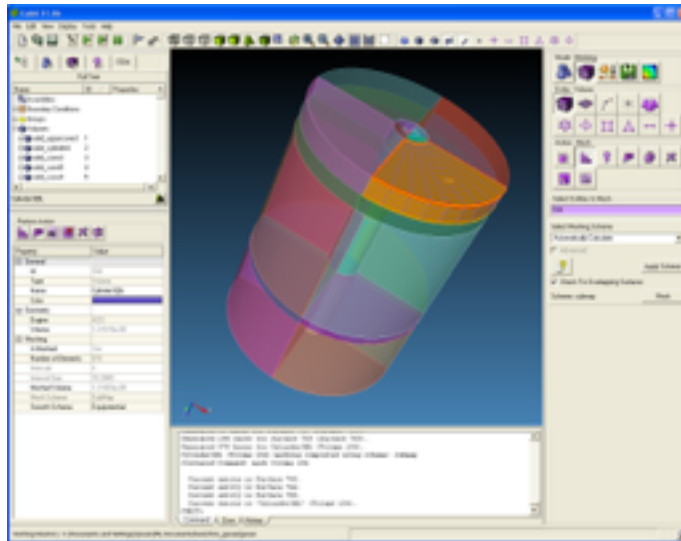


CUBIT/TRELIS

Geometry and Mesh Generation Toolkit



Mesh generation



CAD Model

- ACIS
- STEP
- IGES
- Pro/E
- Facets
- STL
- Exodus II

CUBIT/TRELIS

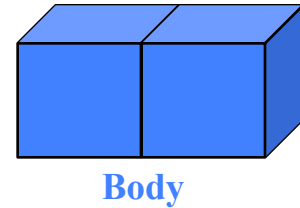
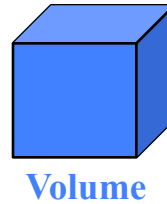
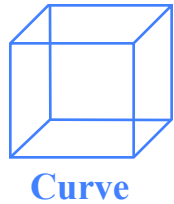
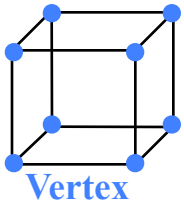
- Meshing Tools
- Geometry Creation
- Geometry Preparation
- Mesh Optimization
- Boundary Conditions
- Scripting
- Automation

Mesh

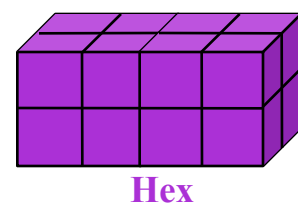
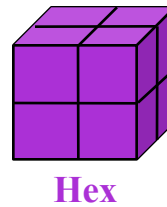
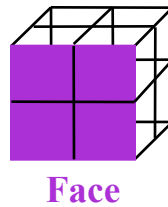
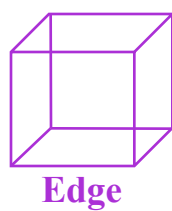
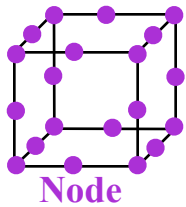
- Exodus II
- Abaqus
- IDEAS-Universal
- NASTRAN-BDF
- Patran
- LS-Dyna

Entity types

Geometry Entities in CUBIT



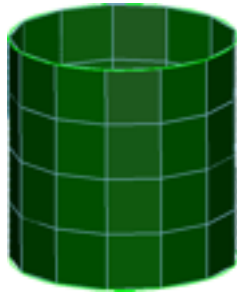
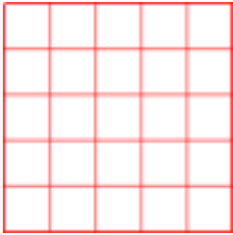
Mesh Entities, which approximate geometry entities of same dimension



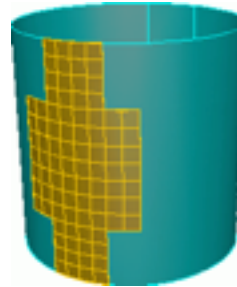
CUBIT Meshes **Vertices** First, Then **Curves**, Then **Surfaces**, Then **Volumes**
(Advancing Front Paradigm)

Meshing schemes

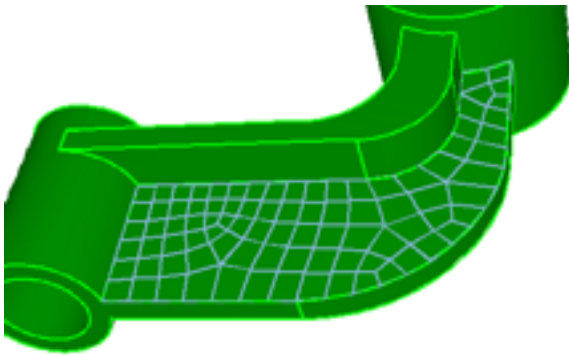
Surface Meshing



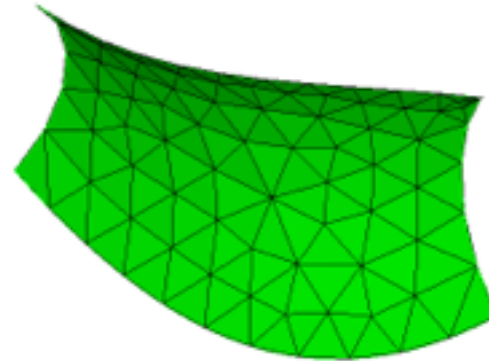
Mapped



Sub-map



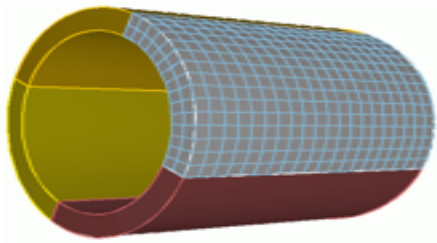
Pave



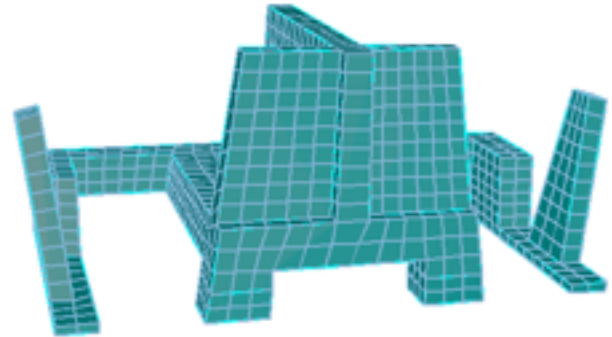
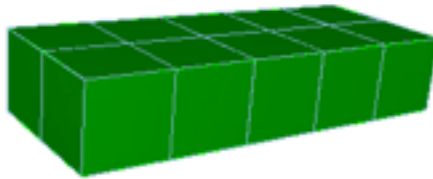
Trimesh

Meshing schemes

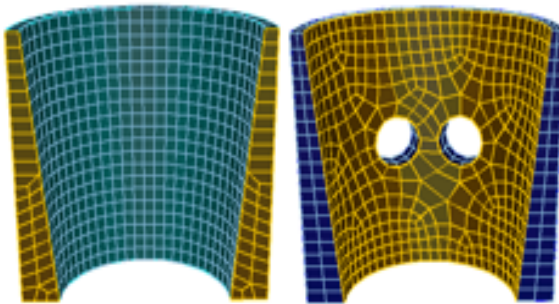
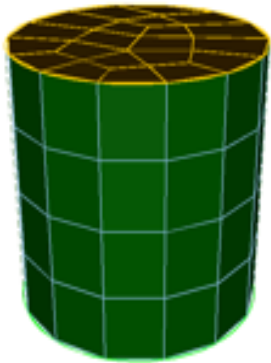
Volume Meshing



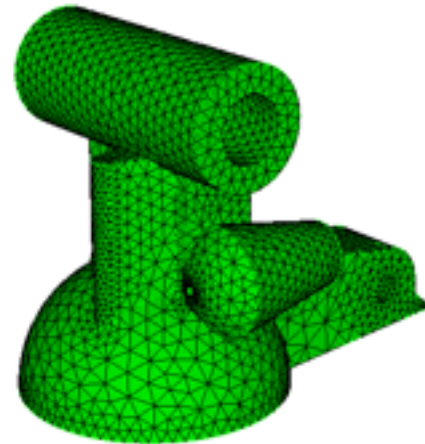
Mapped



Sub-map



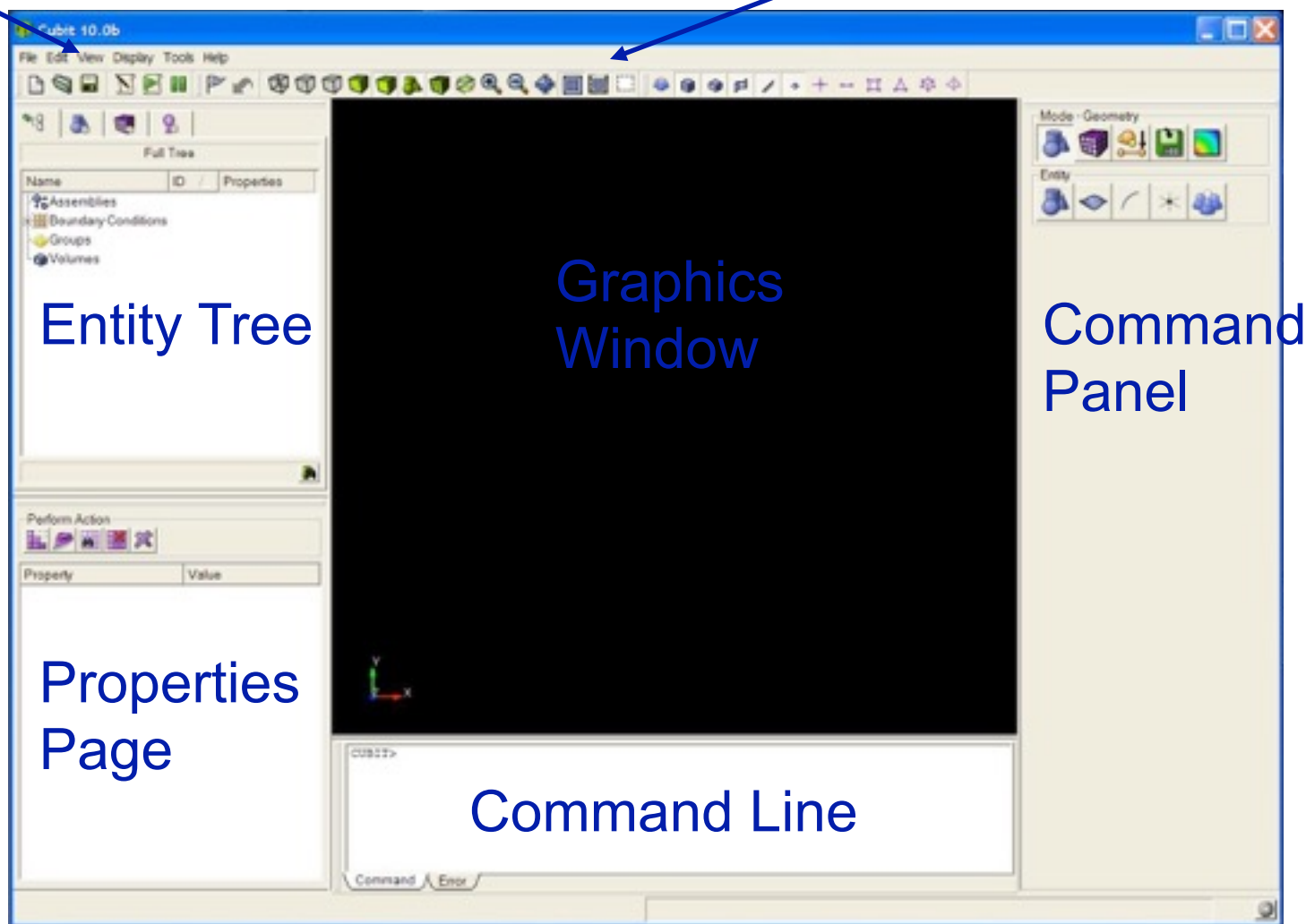
Sweep



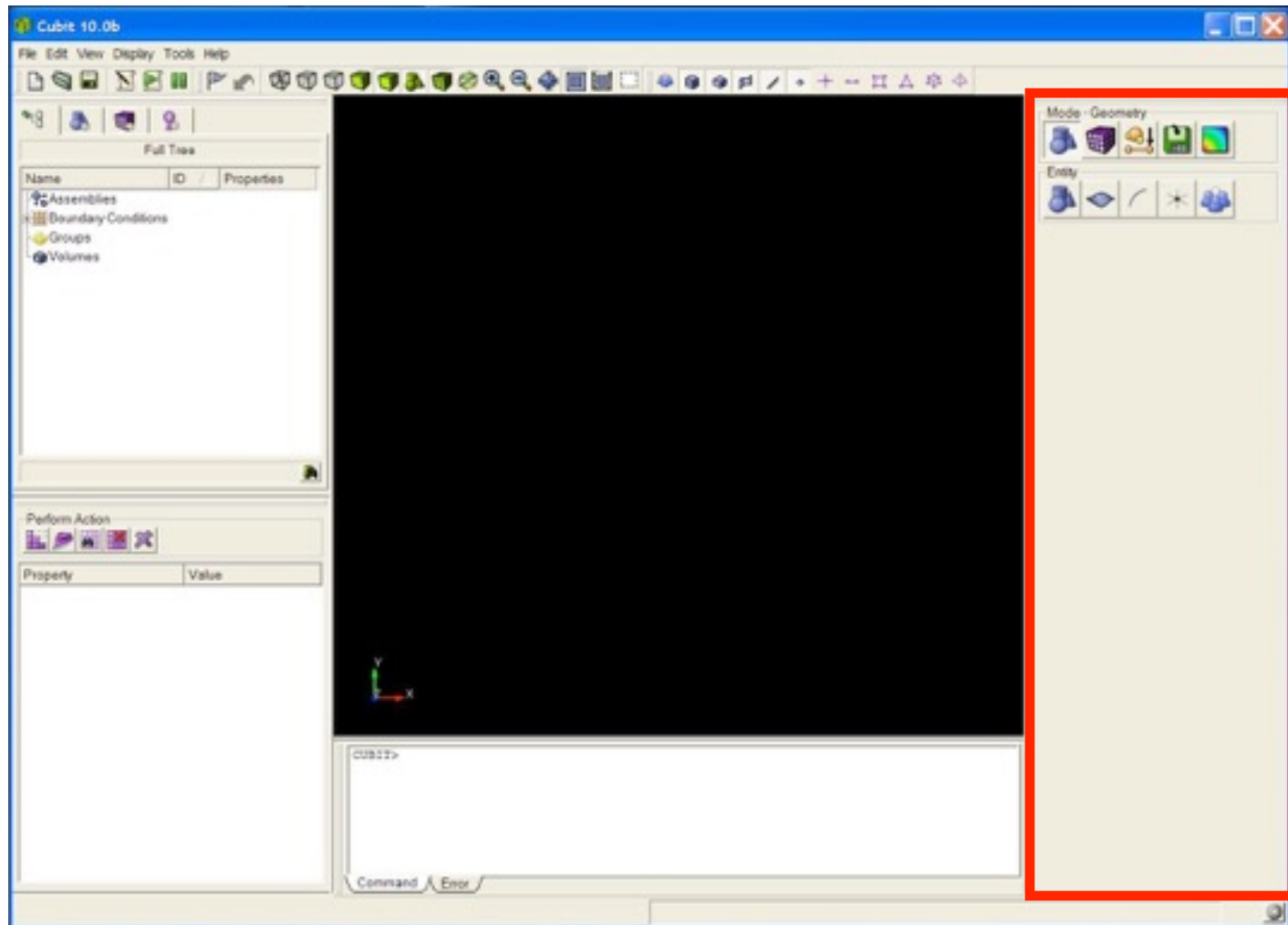
Tetmesh

Drop Down Menu Commands

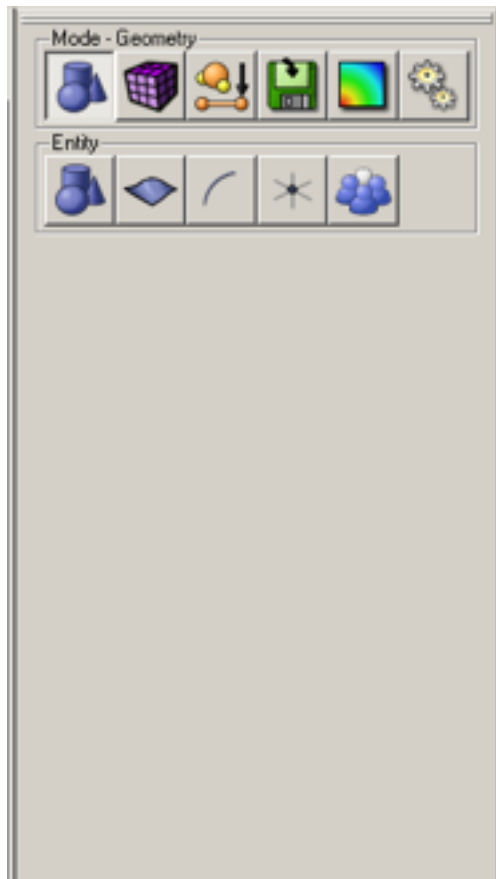
Toolbar
Commands



The Command Panel



Operation Mode Buttons



Press an Icon to enter a new mode



- Geometry: Create, modify, cleanup...



- Mesh: Intervals, schemes, smoothing...



- Properties: Nodesets, sidesets, blocks



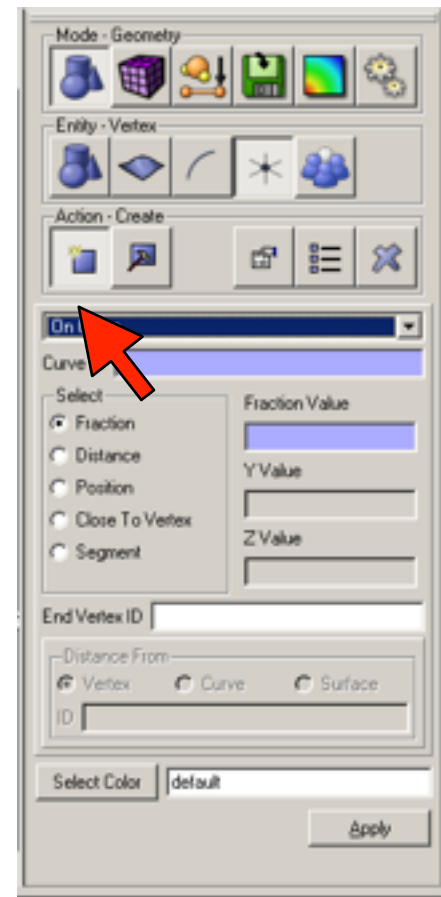
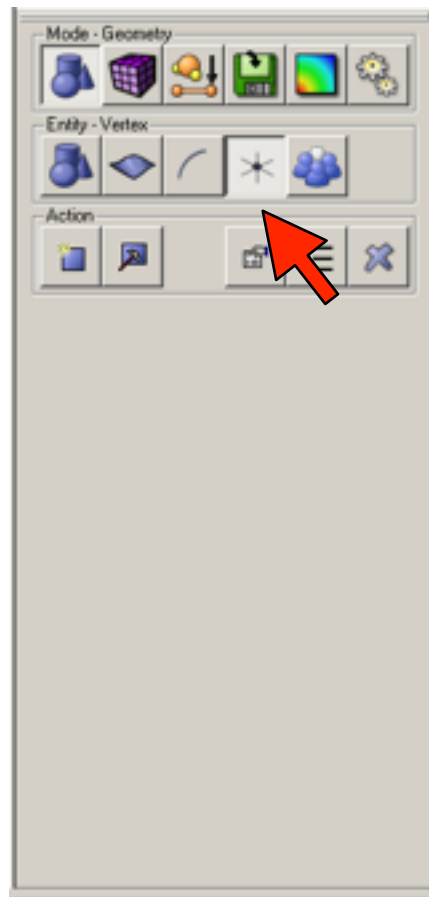
- Analysis Setup: Export mesh



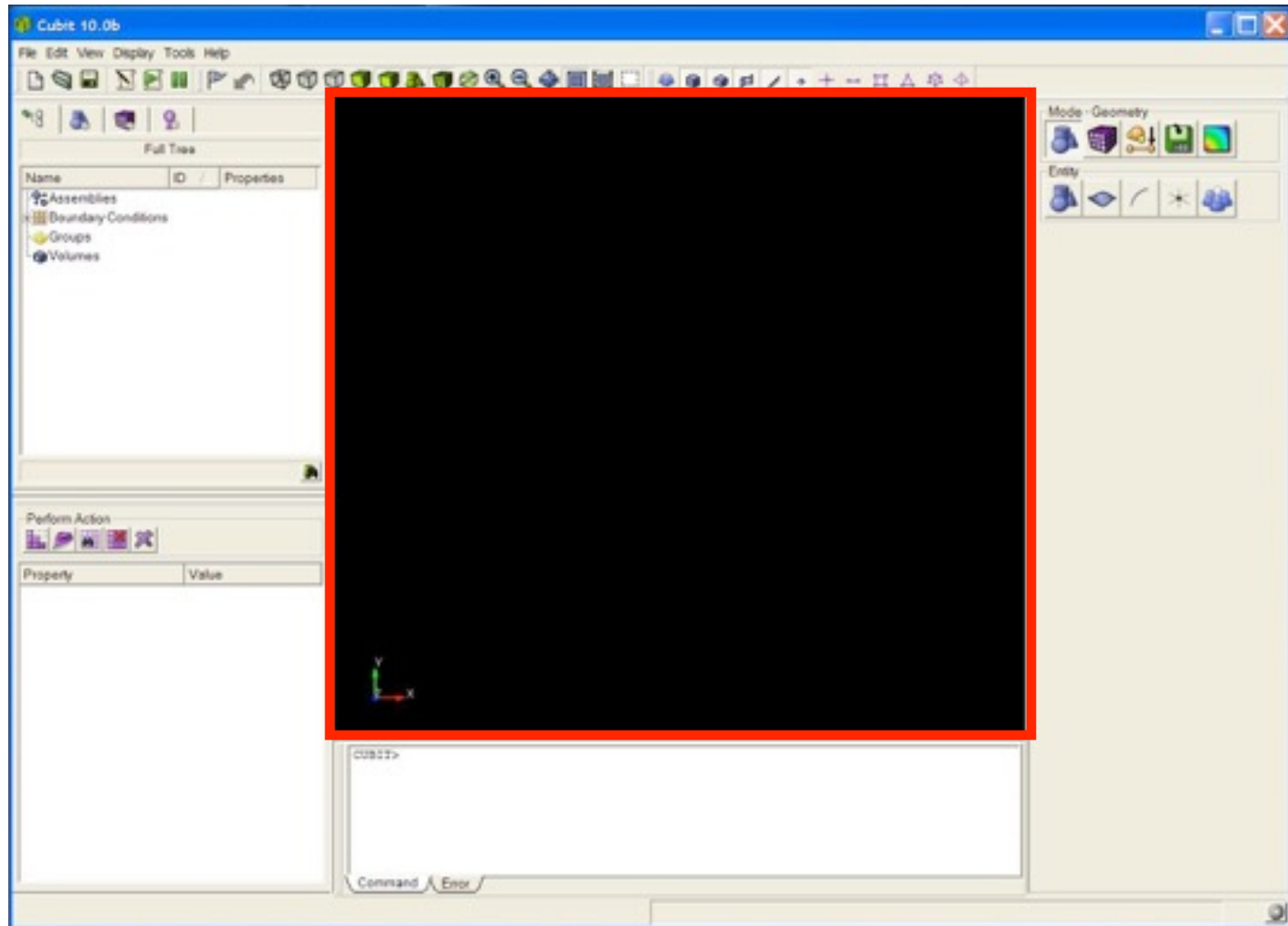
- Post Processing: Customizable shortcut

Operation Mode Buttons

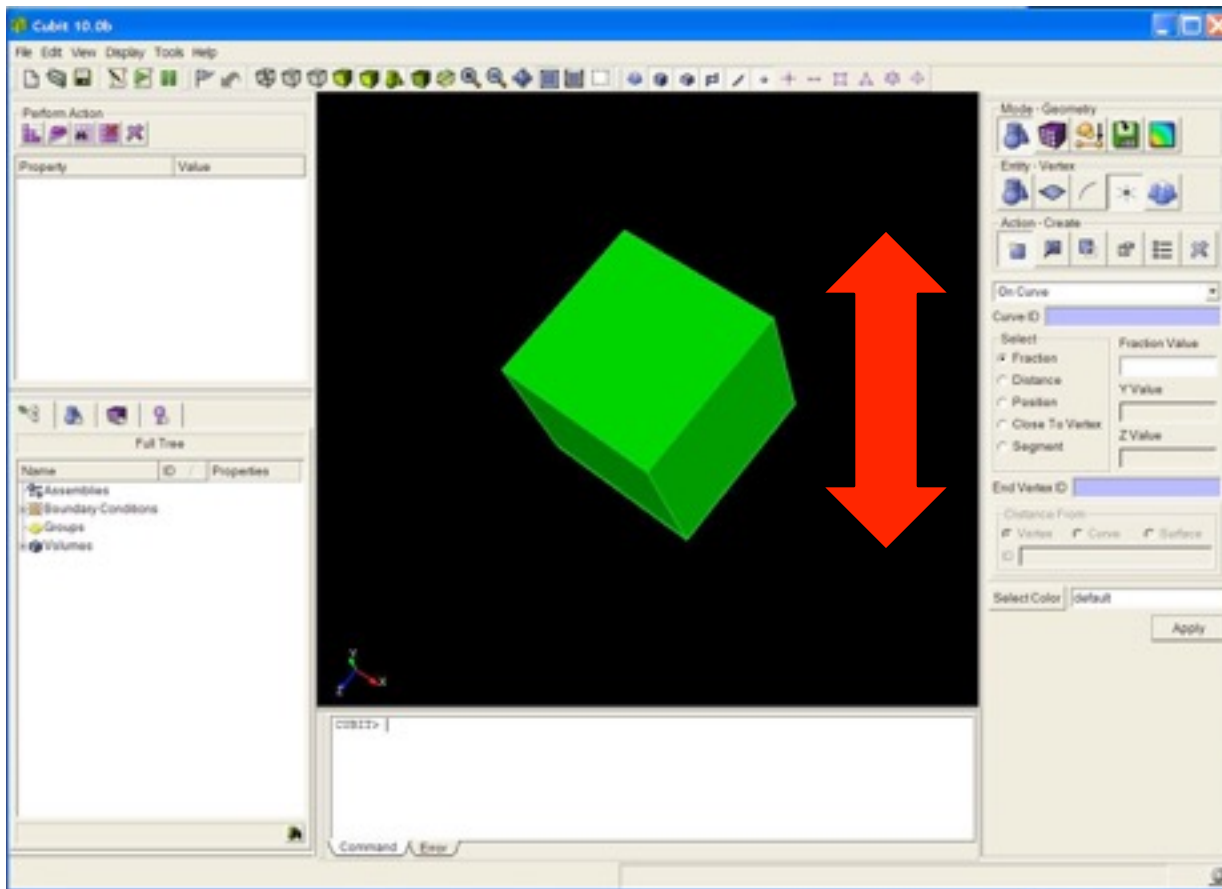
Each Button press takes you to a lower level



The Graphics Window



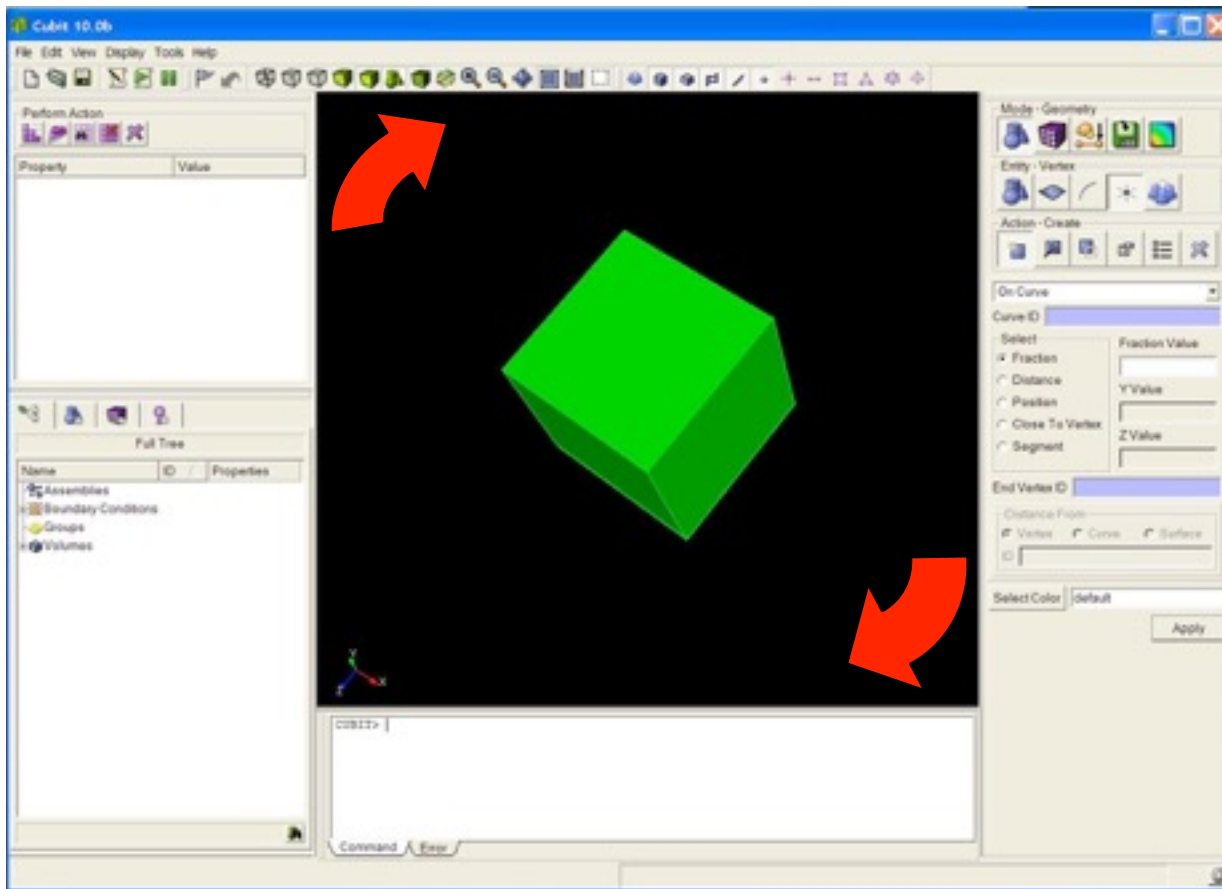
Zooming



To zoom in and out, move the mouse into the graphics window, hold the right mouse button down, and move the mouse pointer vertically.



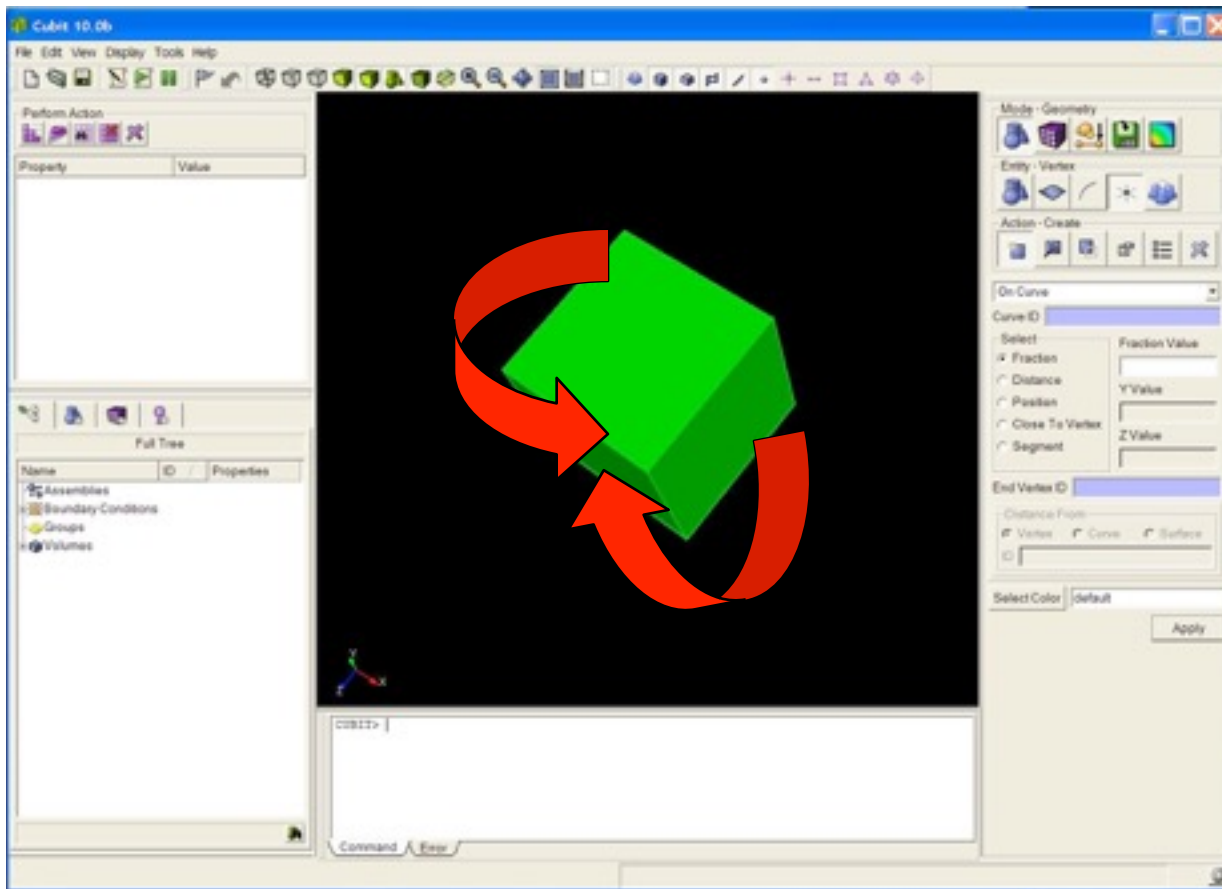
Rotate



To rotate the model about an axis normal to the screen, move the mouse near the edge of the graphics window, hold the middle mouse button down, and move the mouse pointer along the edge of the window



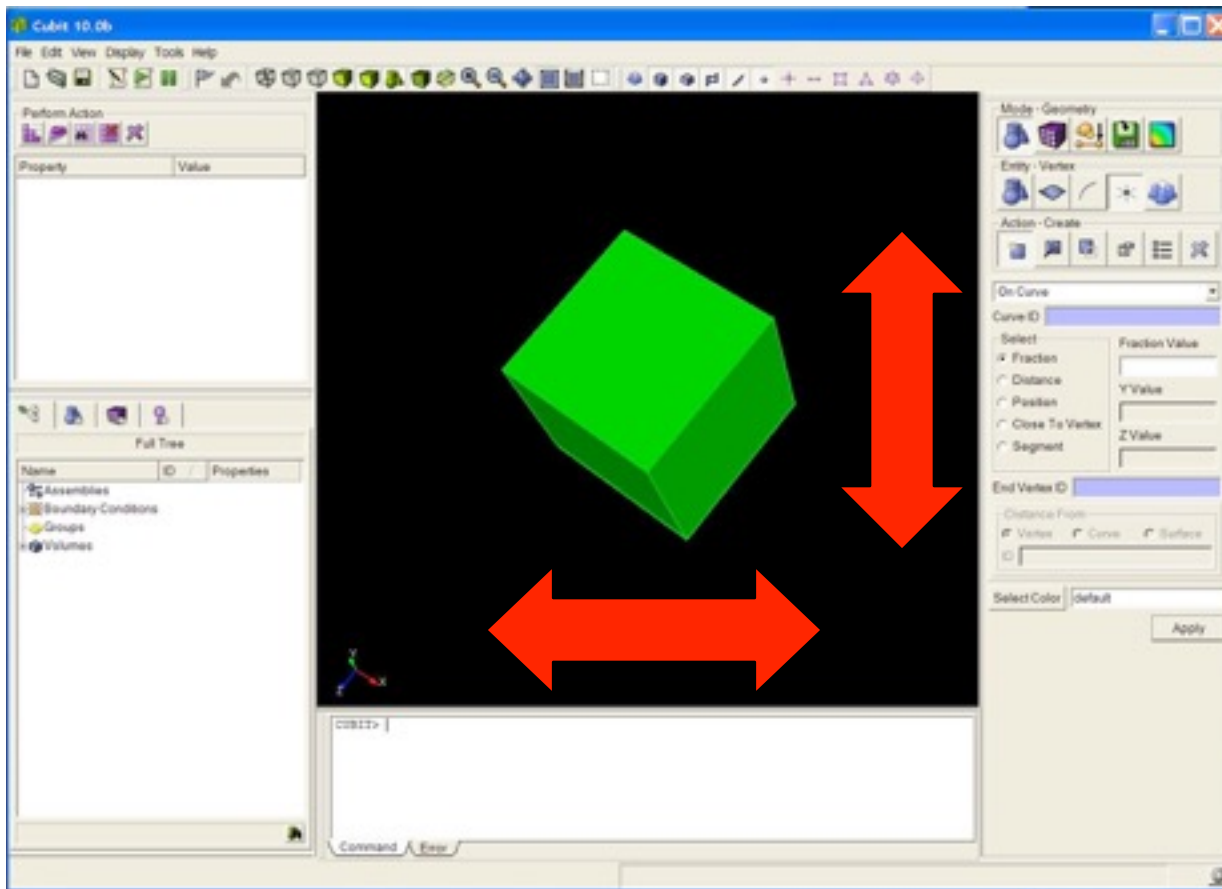
Spin



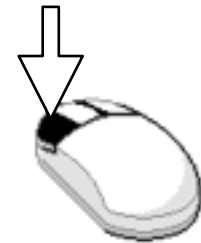
To rotate the model about the spin center, move the mouse near the center of the graphics window, hold the middle mouse button down, and move the mouse pointer.



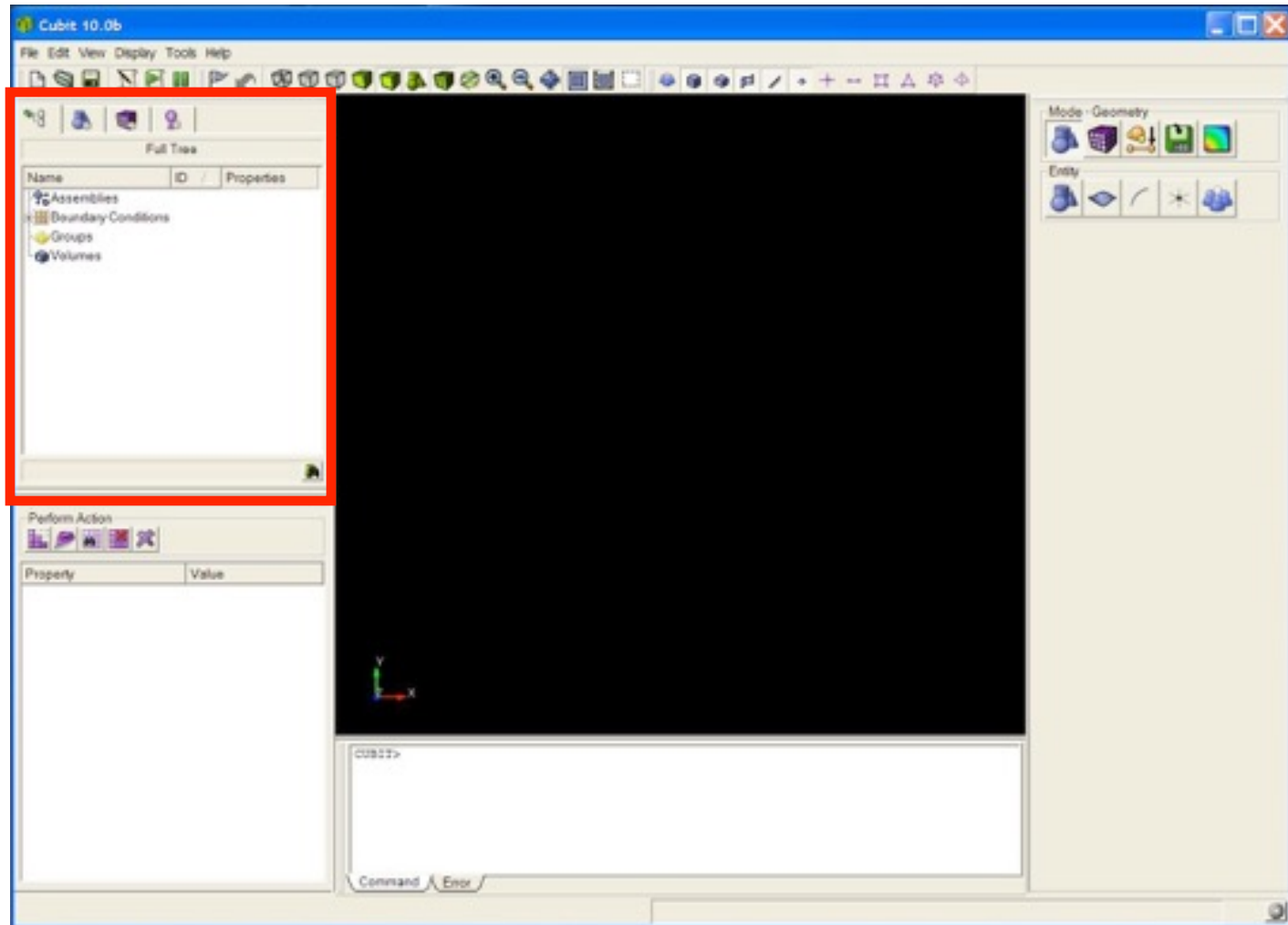
Panning



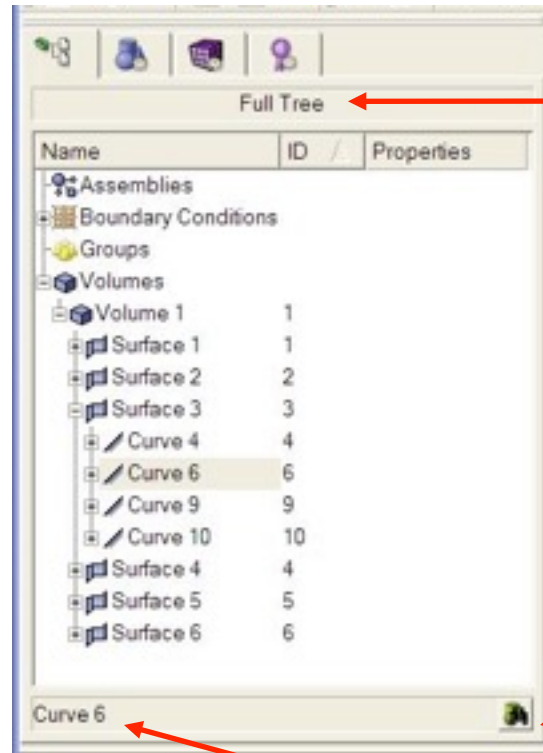
To pan, move the mouse into the graphics window, hold the left mouse button down, and move the mouse pointer horizontally or vertically.



The Tree View



Using the Tree View



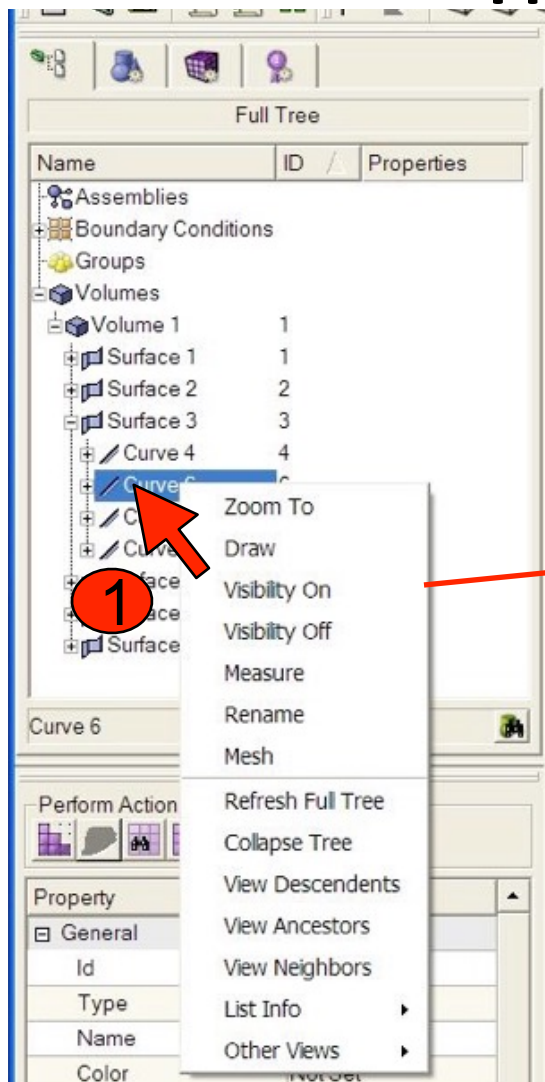
List Type

List View

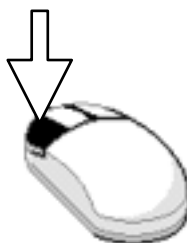
Expand tree to show
selected entity

Current Selection

Tree View Options



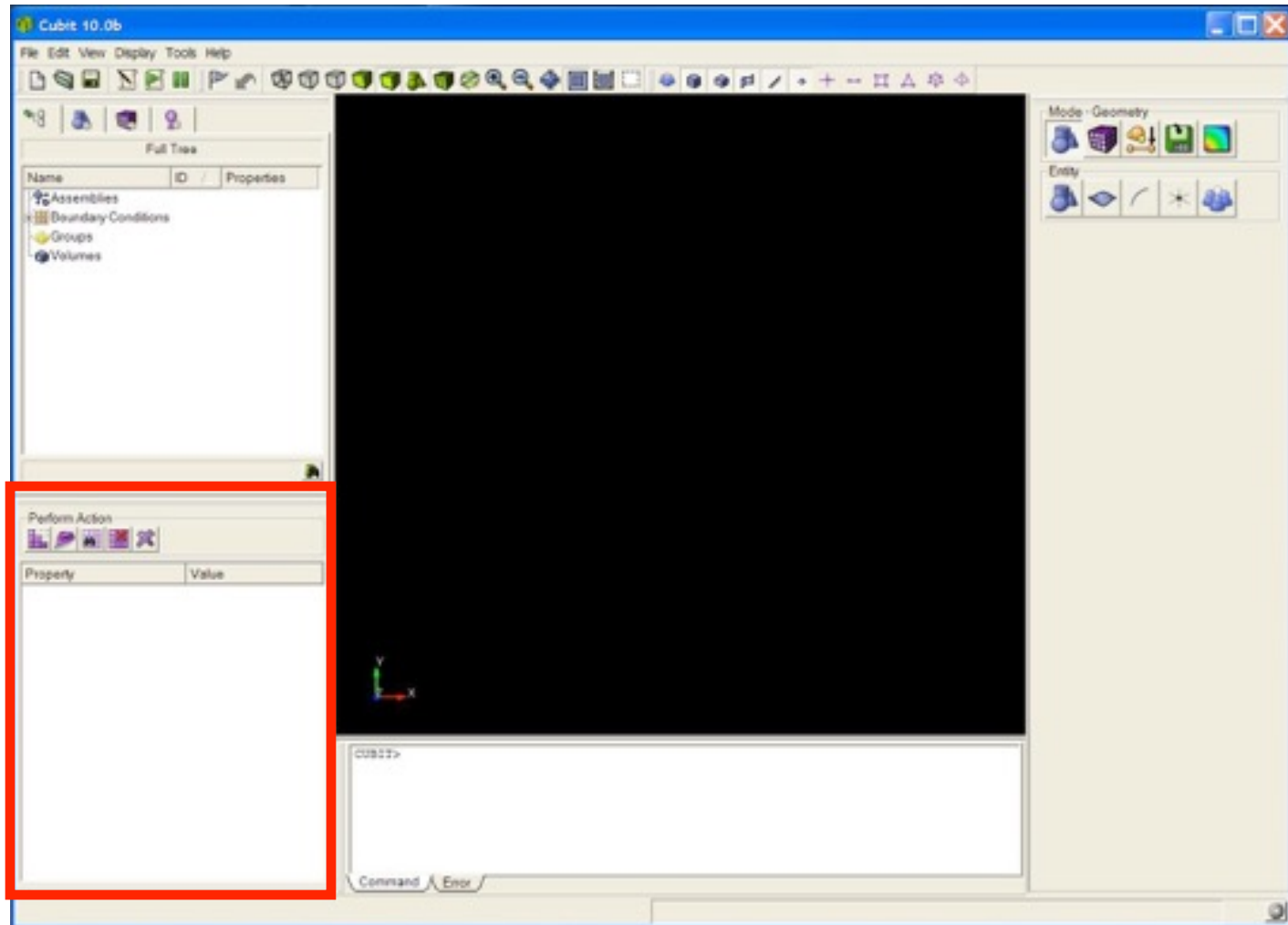
①
Select an
entity in
the tree



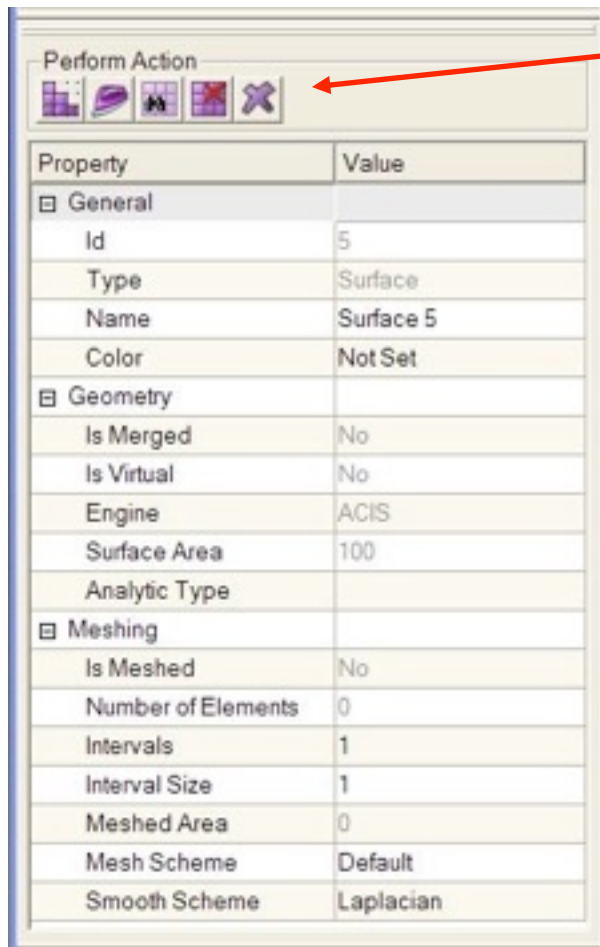
②
Right
Click



The Properties Page



Using the Properties Page

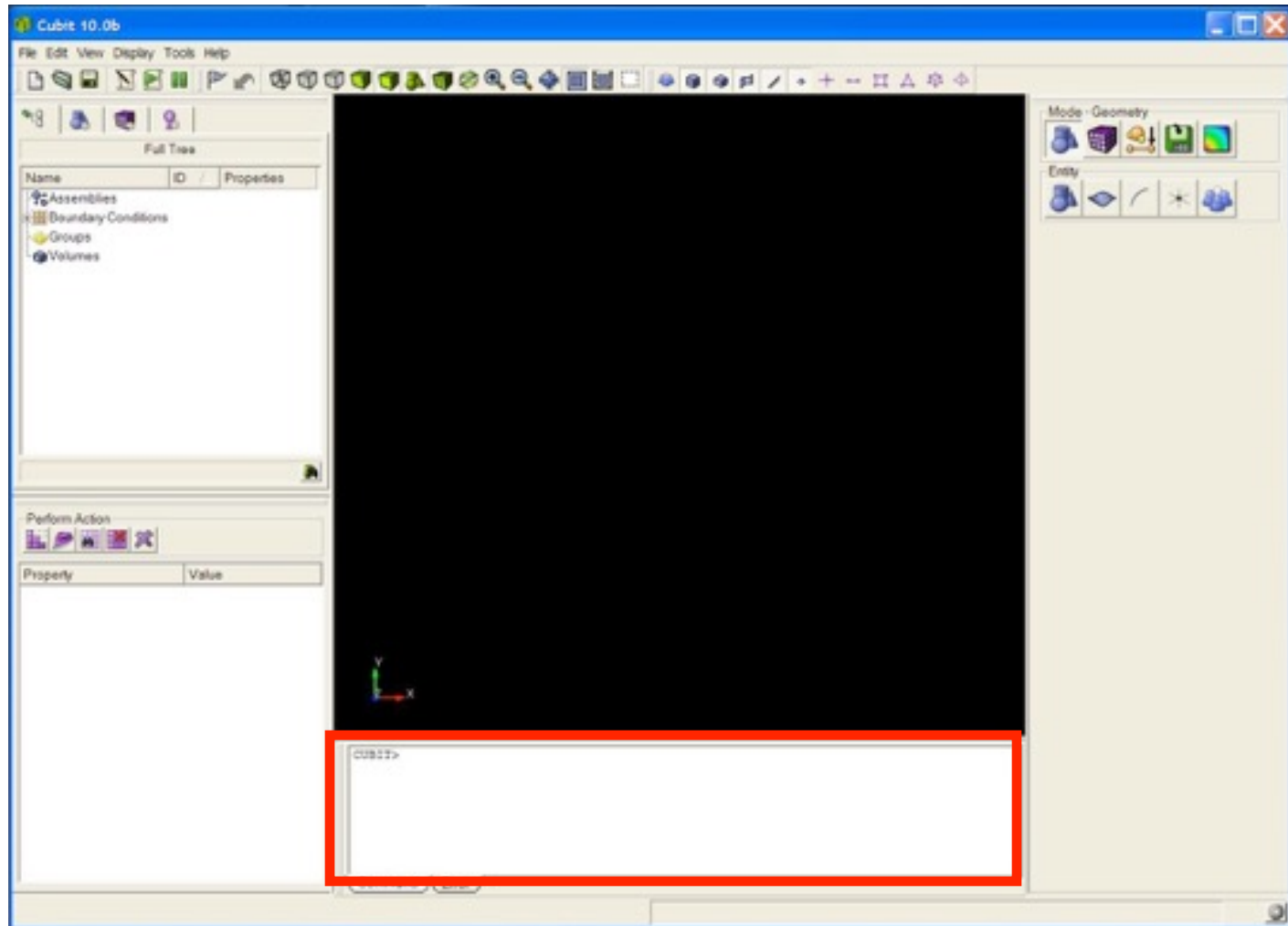


Action Buttons

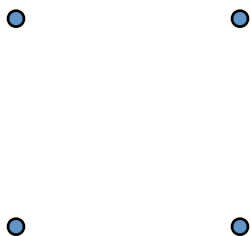
- Mesh
- Smooth
- Preview
- Delete Mesh
- Delete Entity

Entity properties. Grayed properties cannot be edited. Others can be changed from this page.

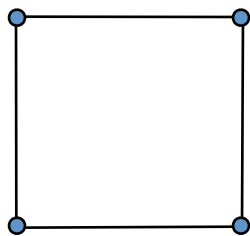
The Command Window



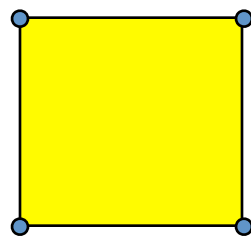
Bottom-Up Geometry Creation



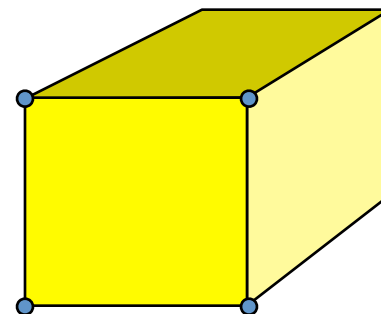
1 Start by defining vertices



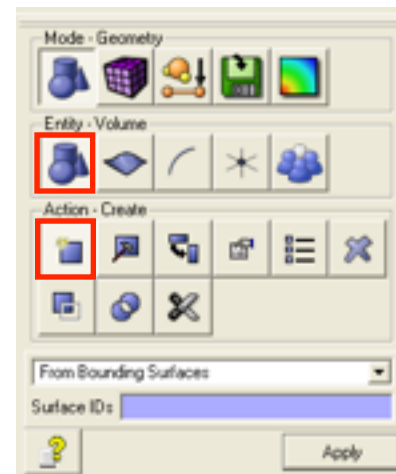
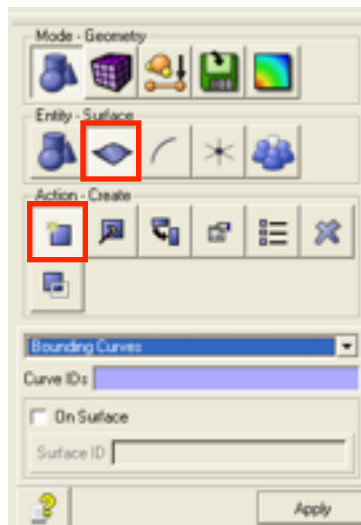
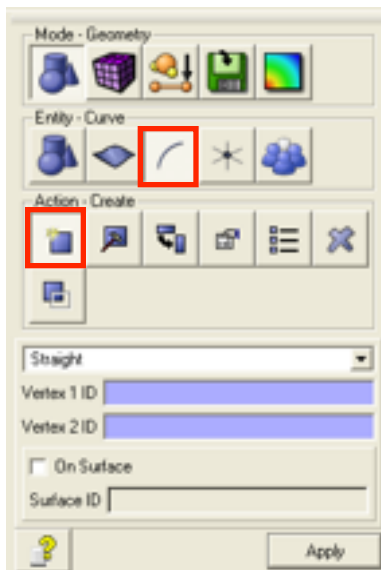
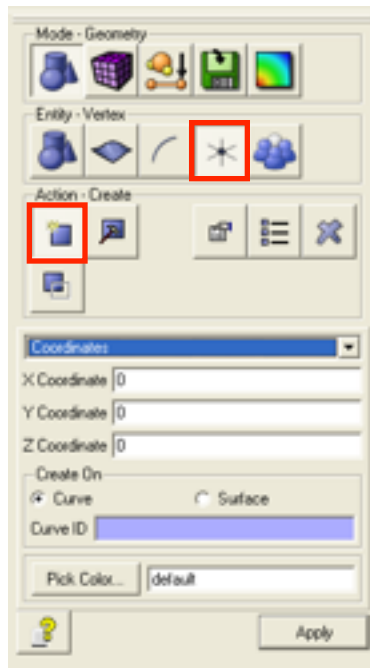
2 Connect them with curves



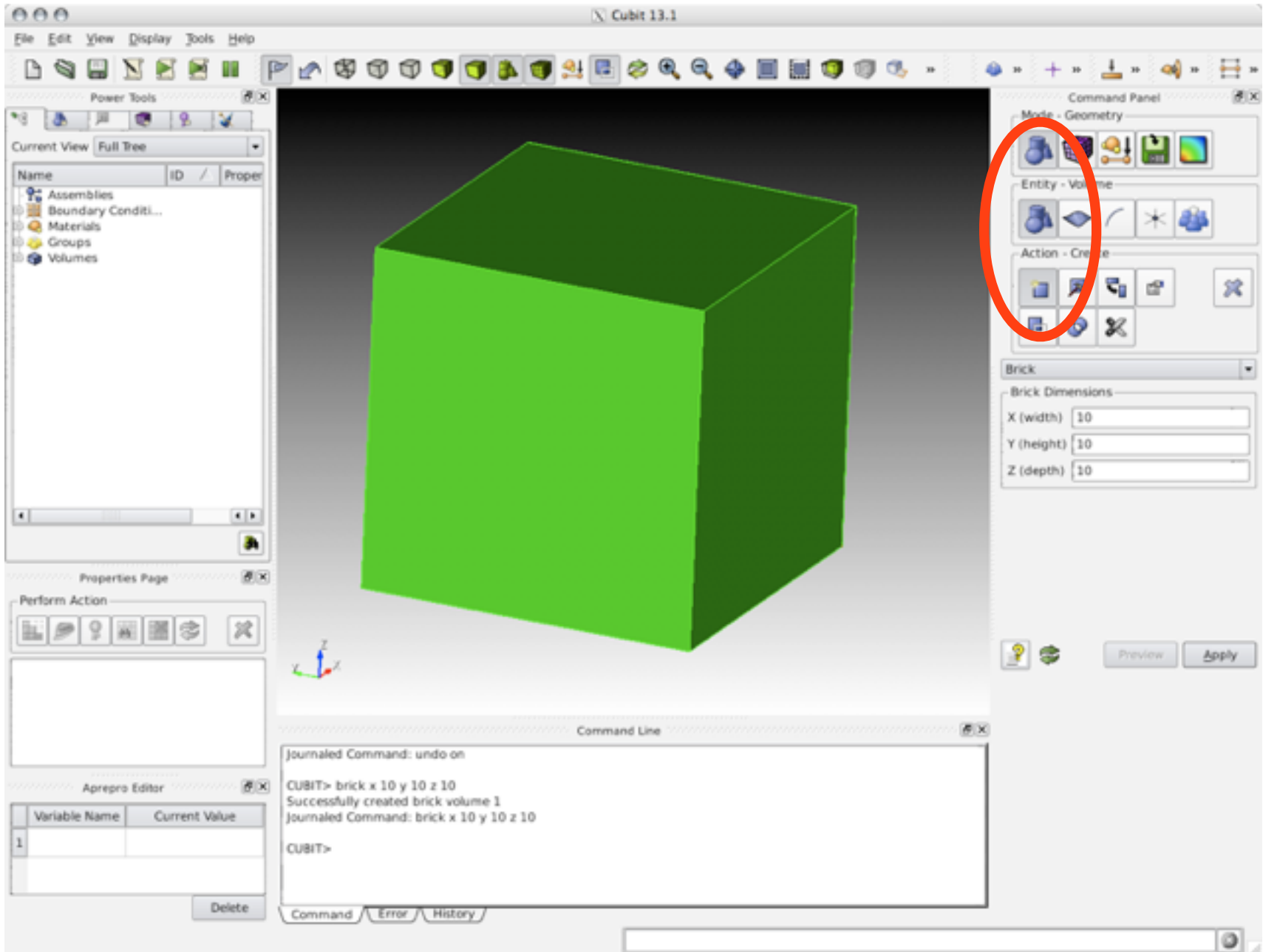
3 Create a surface from a loop of curves



4 Create a volume from a closed set of surfaces



Simple example (3D)



Power Tools

Current View: Full Tree

Name	ID	Proper
Assemblies		
Boundary Condi...		
Materials		
Groups		
Volumes		
Volume 1	1	

Volume 1

Properties Page

Perform Action

Property	Value
General	
Id	1
Type	Volume
Name	Volume 1

Aprepro Editor

Variable Name	Current Value
1	

Command Line

```
CUBIT> brick x 10 y 10 z 10
Successfully created brick volume 1
Journaled Command: brick x 10 y 10 z 10

Current entity is Volume 1.
CUBIT> volume 1 scheme Map
Journaled Command: volume 1 scheme map

Current entity is Volume 1.
```

Command Error History

Command Panel

Model - Meshing

Entity - Volume

Action - Intervals

Select Volumes

1

Auto

Auto Factor

Fine Coarse

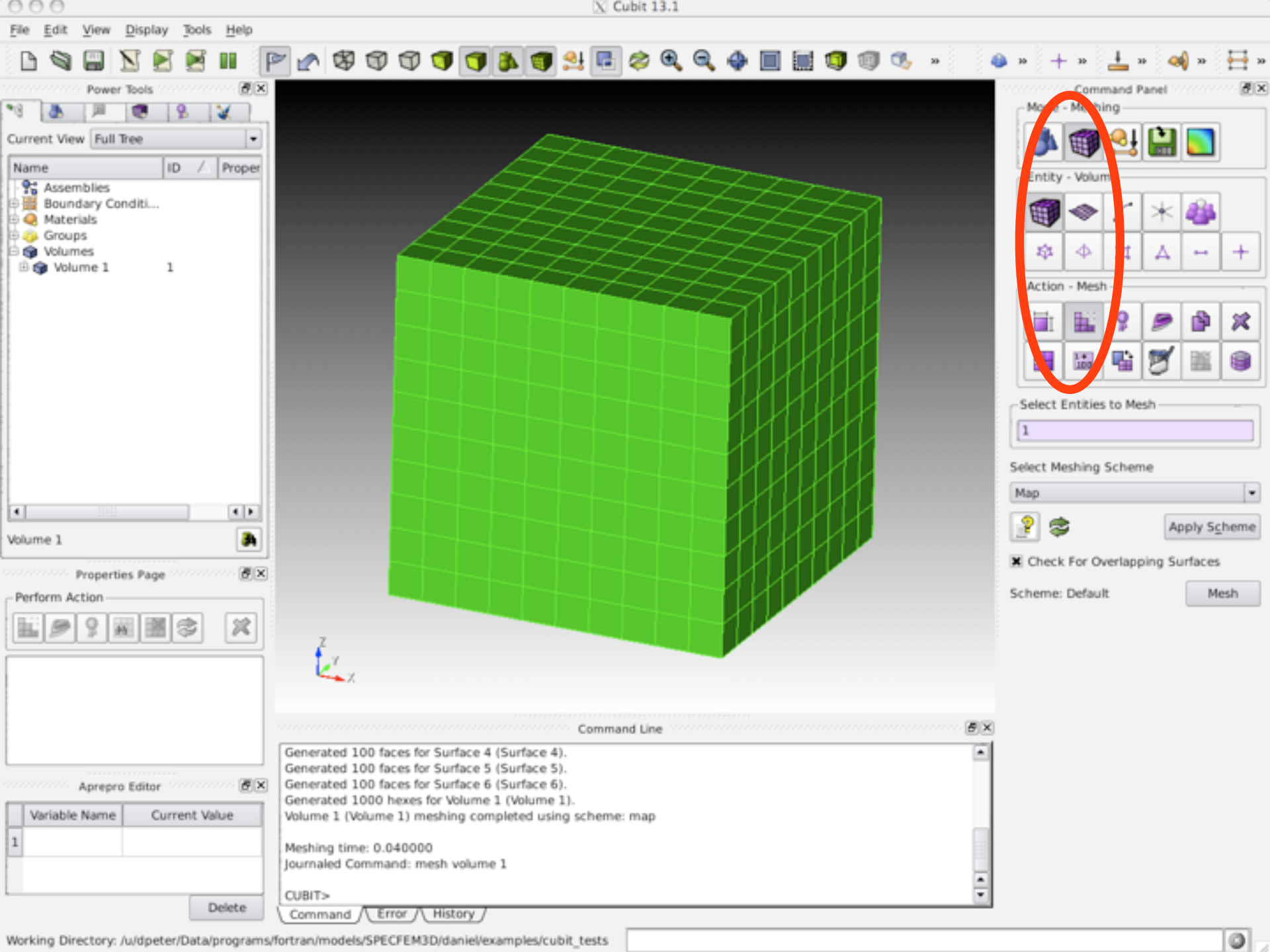
Approximate Size: 0.630825

Preview

Check For Overlapping Surfaces

Apply

Mesh



Downloads

STL surfaces

- google: STL download
- <https://www.thingiverse.com>
- <https://grabcad.com/library>
- <https://nasa3d.arc.nasa.gov>