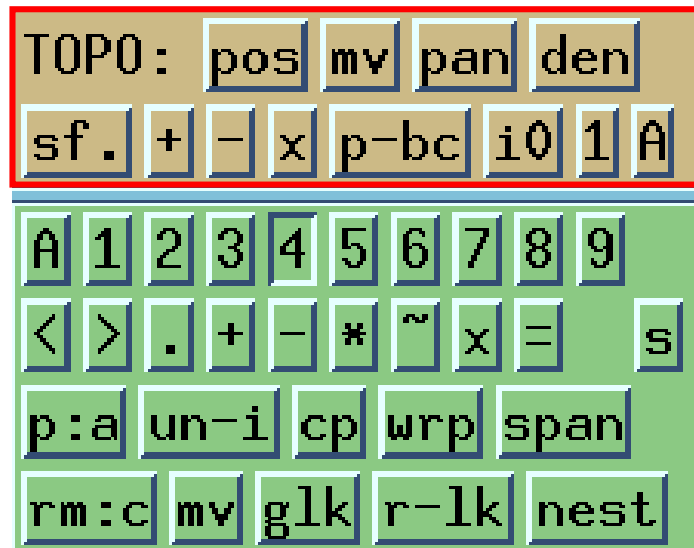


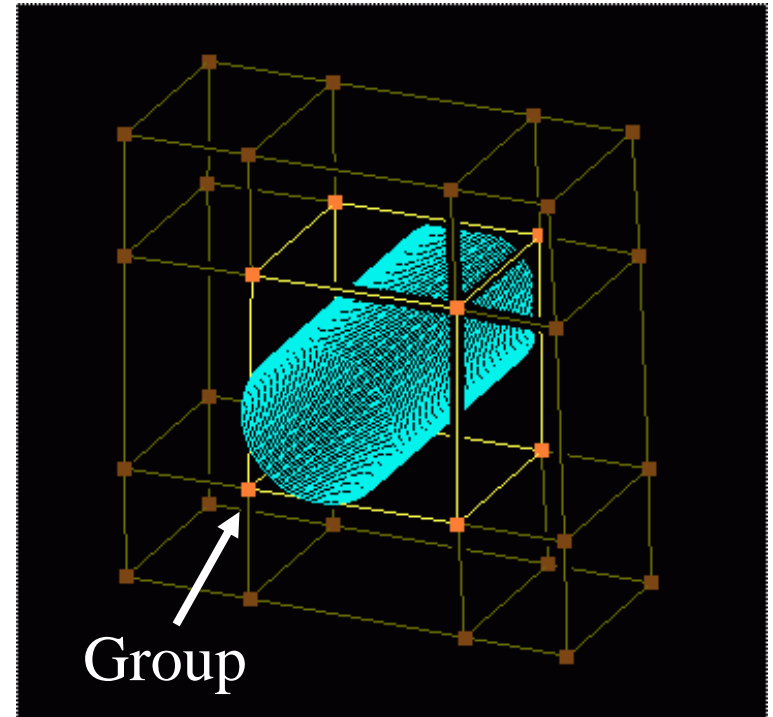
Topology Creation Tools

- GridPro contains many advanced topology creation tools
- These tools allow the user to **group**, **copy**, **pancake**, **move**, **insert**, **link** and **edit** topology
- The topology sub-command panel:



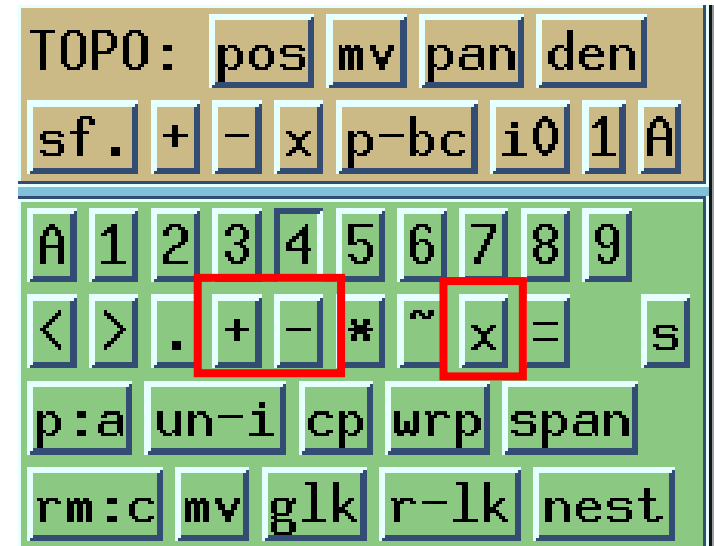
Group

- Grouping is one of the most widely used functions in GridPro
- Allows the user to carry out tasks on specific parts of the topology
- Any number of points and edges of the topology can be added or subtracted to a group at any time
- **Active** group is always in **bright yellow**, **inactive** topology is always **shaded dark**.



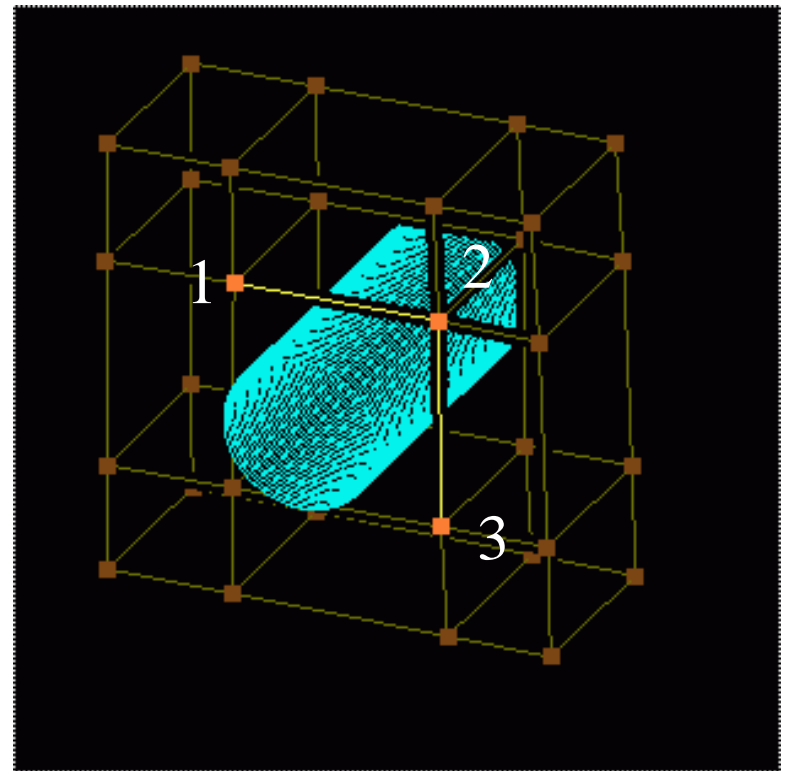
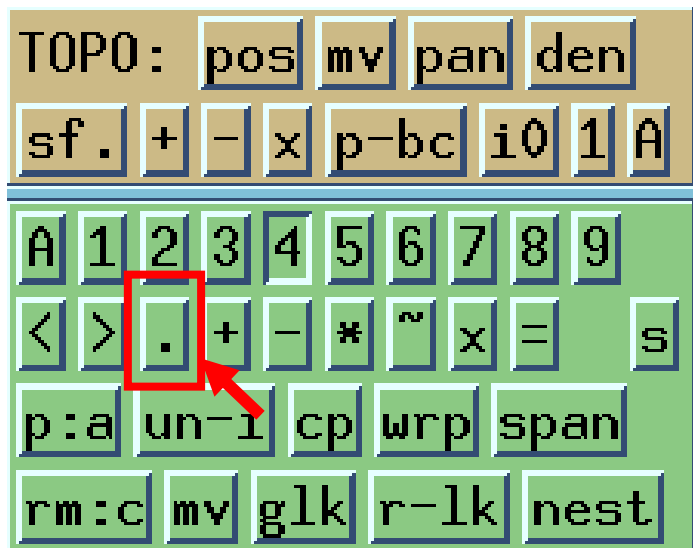
Adding or Subtracting Topology to a Group

- Click on a group button
- Click on (+) button and draw a box with right mouse button around the topology.
- To subtract topology from a group click on (-) button and draw a box around topology
- All topology can be emptied from a group by clicking on (x)



Contd...

- Can add topology points and edges individually by clicking on the (.) button and choosing each point with the left mouse button



Add a Group from another Group

- TOPO Panel functions as a calculator such that one group can be added, subtract or intersected with another group

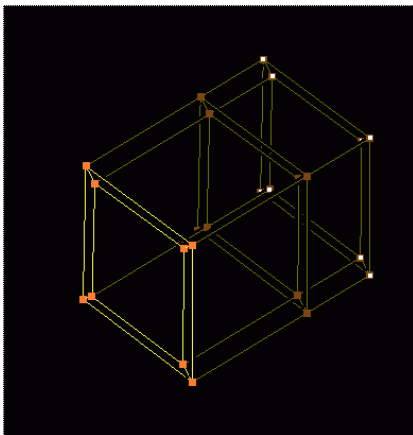
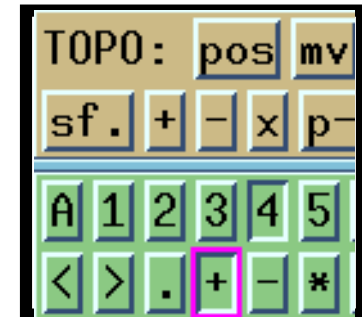
Example: Add **Group 2** topology to **Group 1**

Step 1: Click on **Group 1** to make it active

Step 2: Click on the (+) button in the **TOPO Menu**

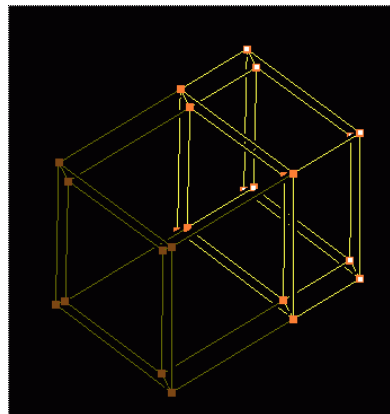
Step 3: Click on **Group 2**

TOPO Menu



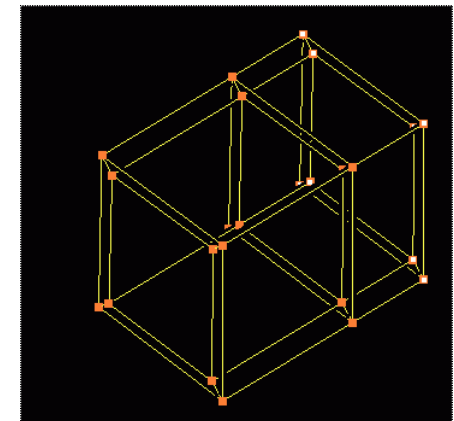
Group 1

+



Group 2

=

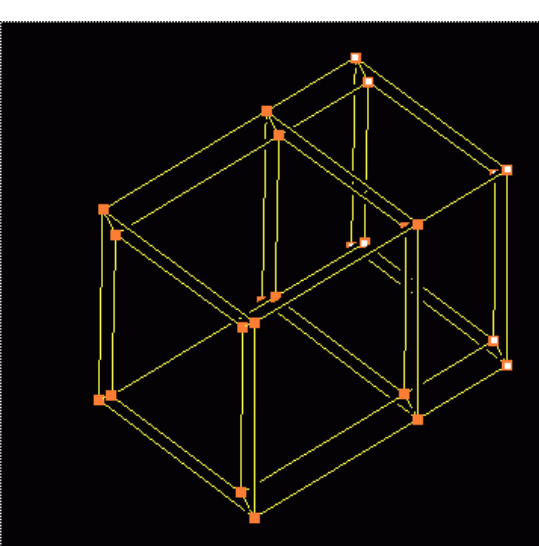


Subtract a Group from another Group

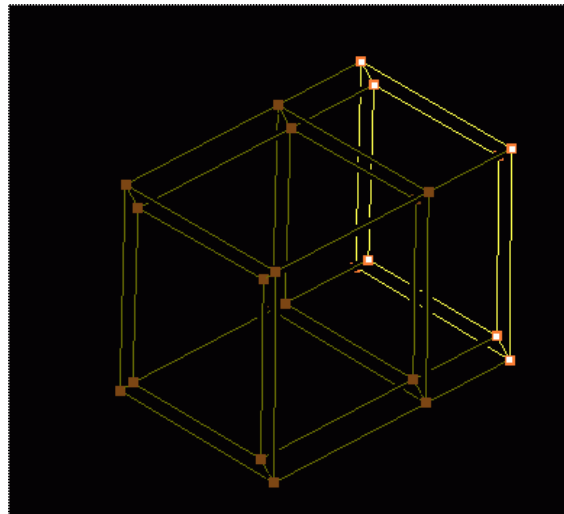
Step 1: Click on **Group 1** to make it active

Step 2: Click on the (-) button in the **TOPO Menu**

Step 3: Click on **Group 2**

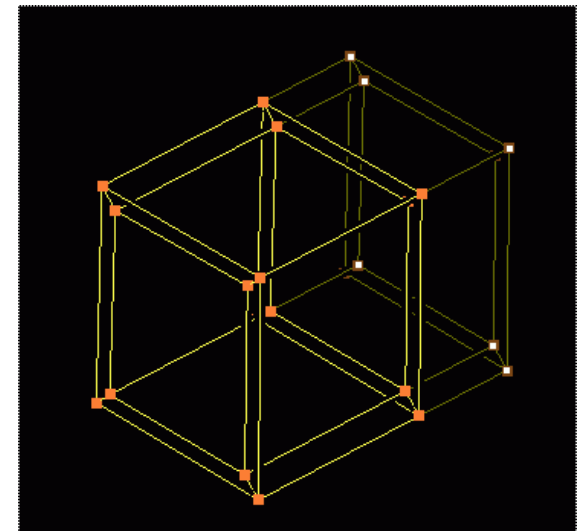


Group 1



Group 2

=

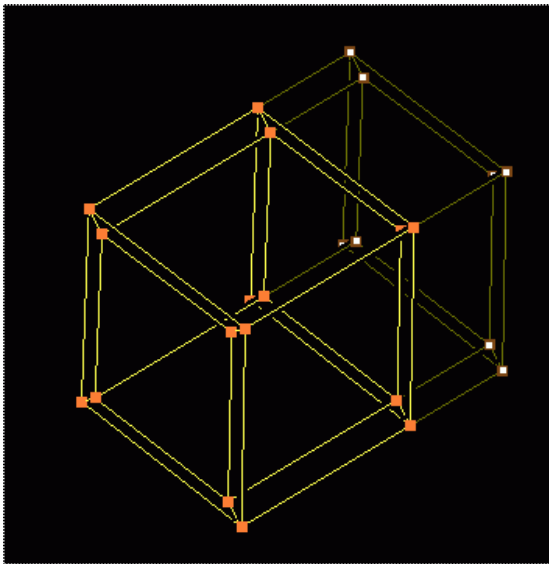


Intersection a Group from another Group

Step 1: Click on **Group 1** to make it active

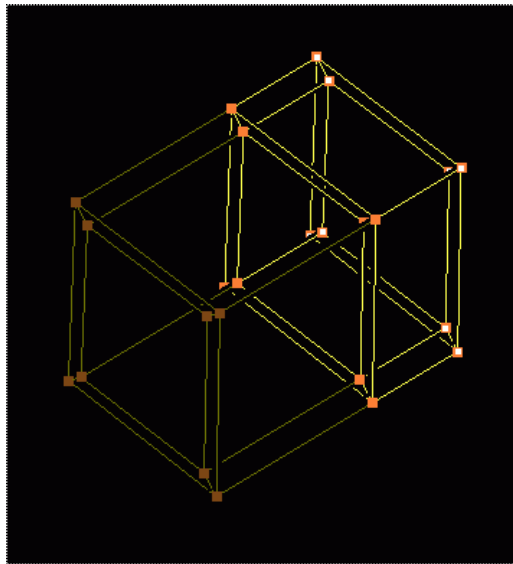
Step 2: Click on the (*) button in the **TOPO Menu**

Step 3: Click on **Group 2**



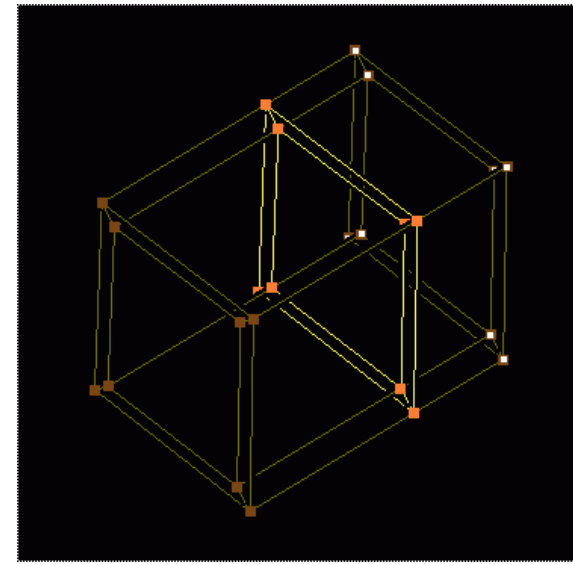
Group 1

*



Group 2

=



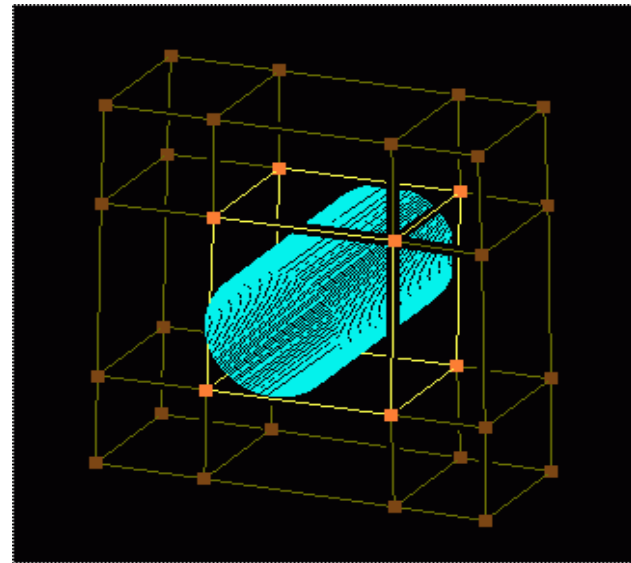
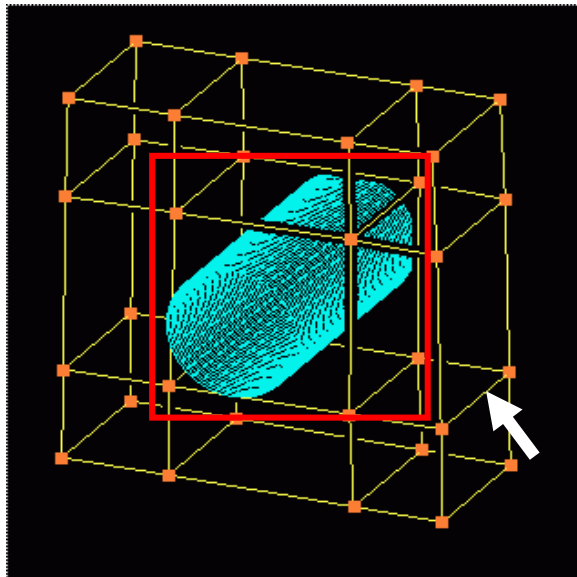
Contd...

- Another example of intersection

Step 1: Click on the (*) button

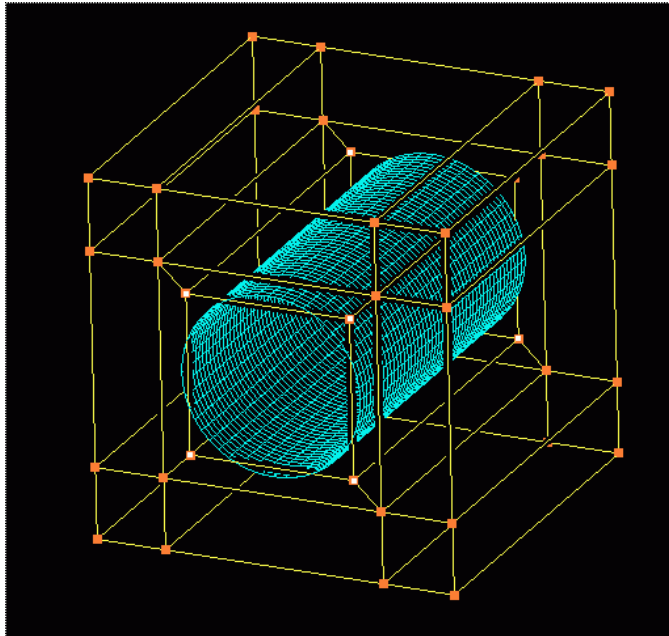
Step 2: Draw a box around the topology you want to isolate

Step 3: All other topology will be deleted from the group

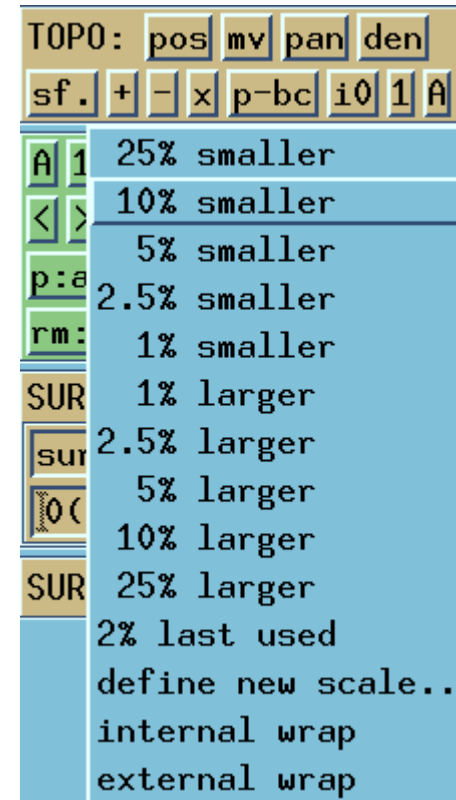


Wrapping

- Always the last step in process
- The scale should be chosen such that the wrap is closest the target surface

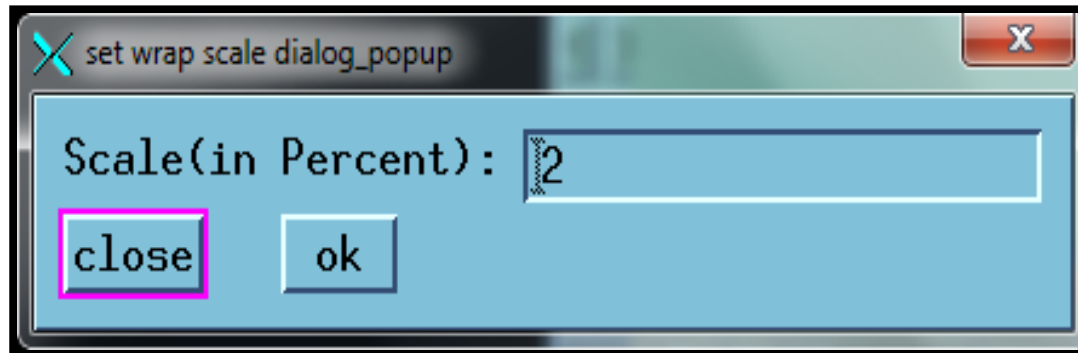


This object wrapped 10% Smaller



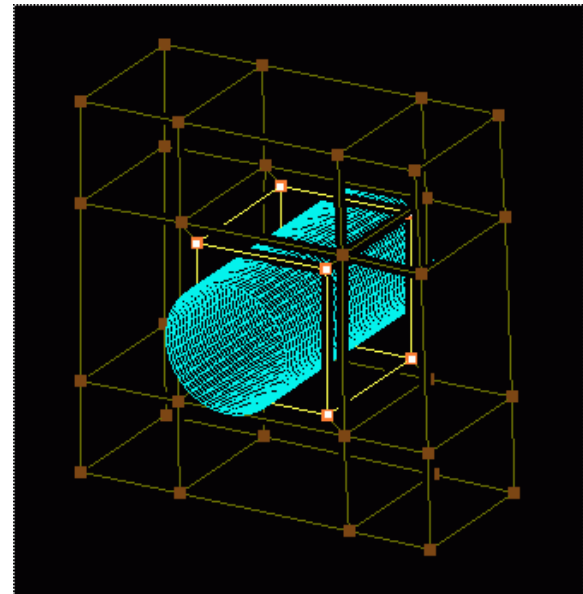
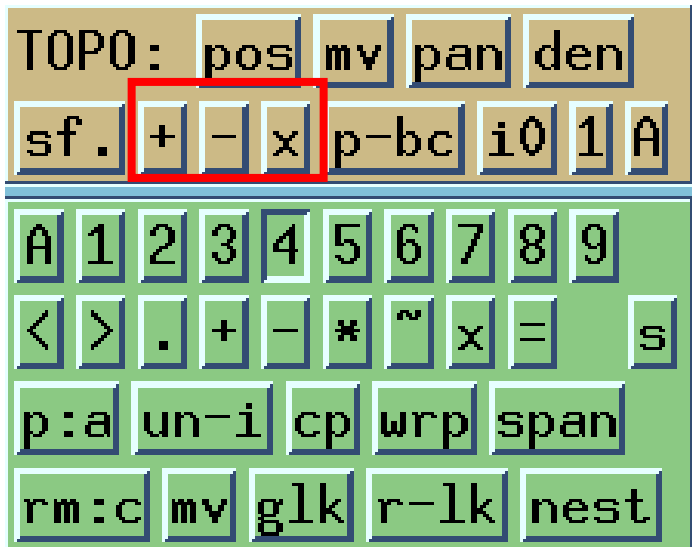
Variable Wrap Scale

- At times the default wrap lengths may not be suitable to your topology or model, i.e. the scale may be too big or too small
- You can specify your own wrap scale that is a multiple of a global default scale



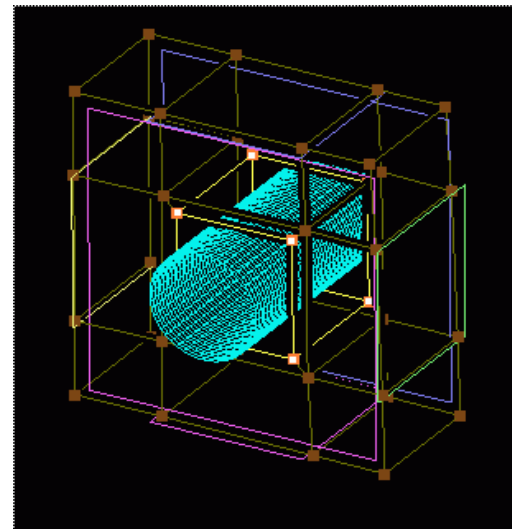
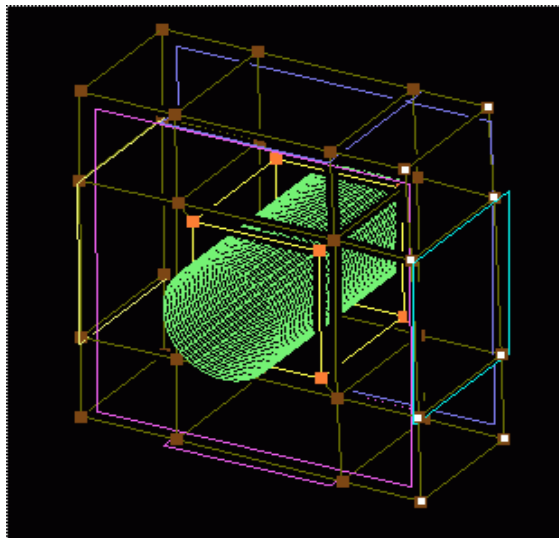
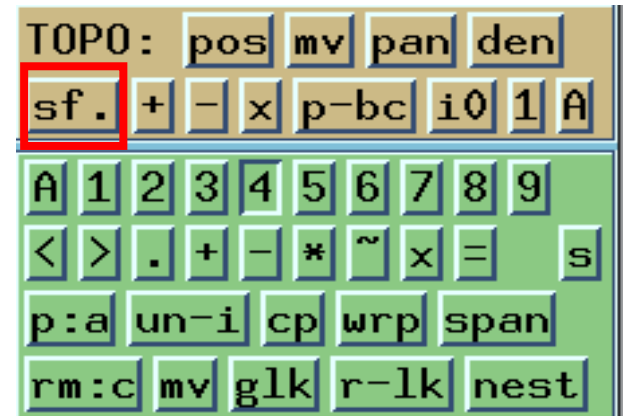
Surface Assignments

- Assign topology to surface using (+) button, assigned topology is always colored in white
- Take away surface assignment using (-) button
- Remove all assignments using (x) button
- Assign topology only to current surface that is colored in light blue



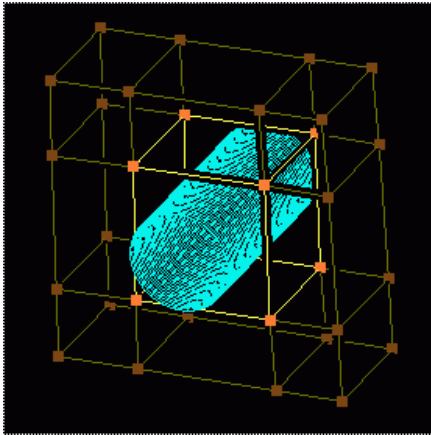
Choosing Current Surface

- Click on the (sf.) button and then click on surface
- Surface will be shaded in light blue showing that it is the current surface

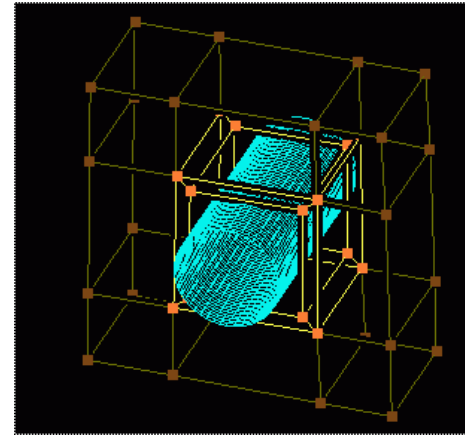


Quick Assignment Technique

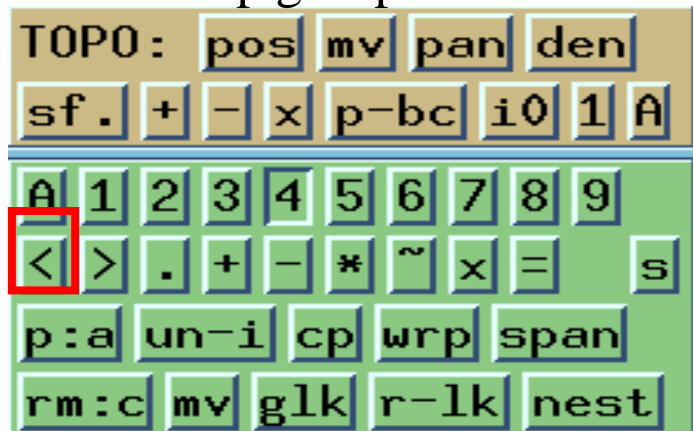
1. Add the topology to a group



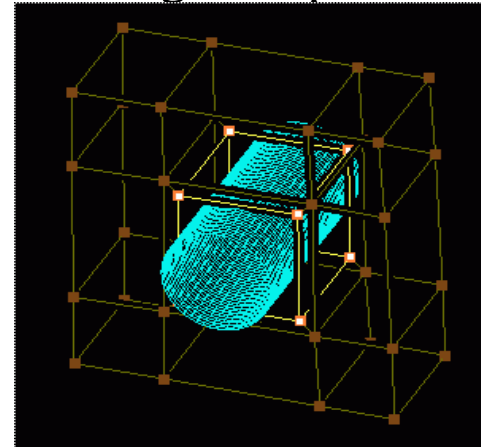
2. Wrap Group



3. Back up group to isolate wrap

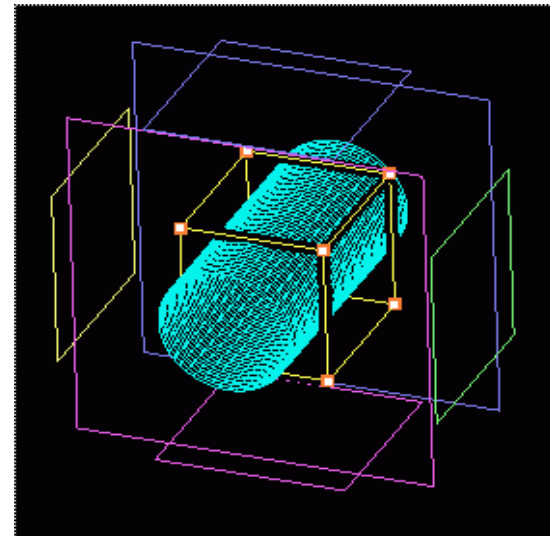
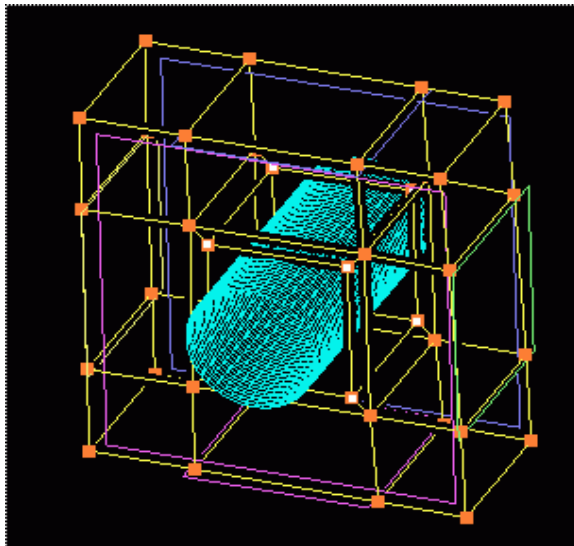
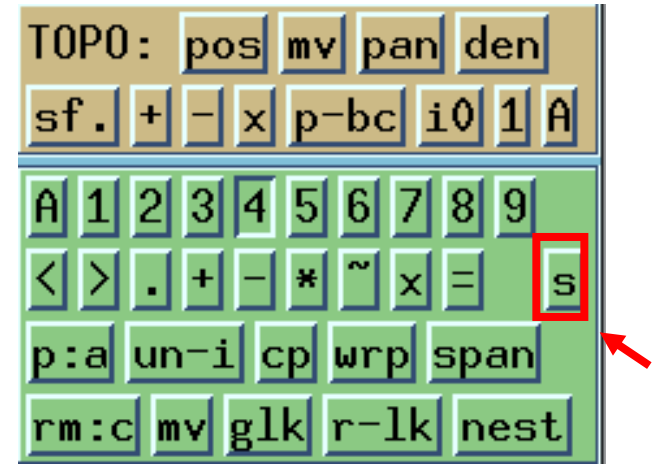


4. Assign wrap to surface



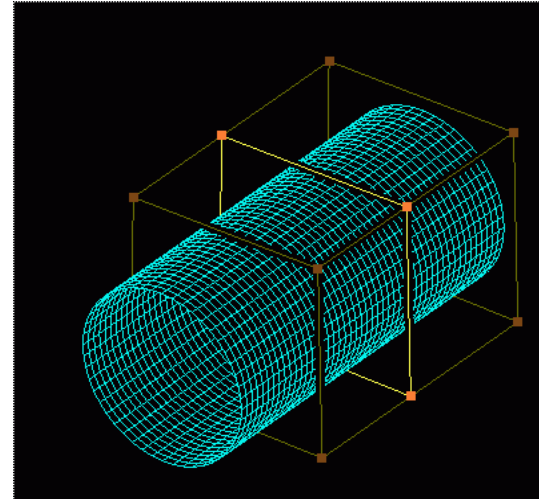
Viewing Surface Assignments

- The topology assignments for any surface can be immediately viewed by clicking on the (s) button

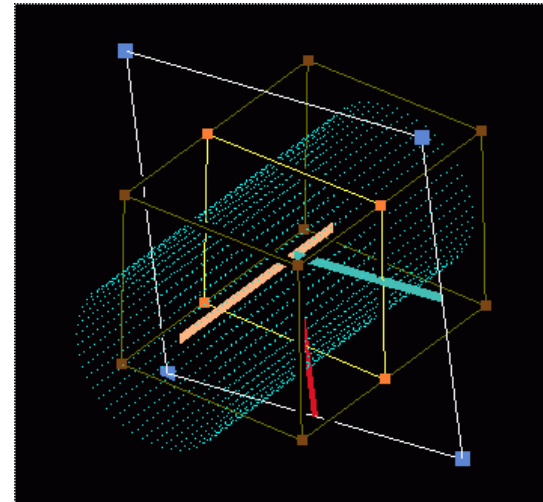
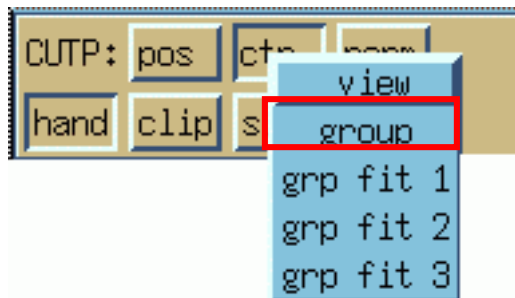


Moving topology

1. Group topology

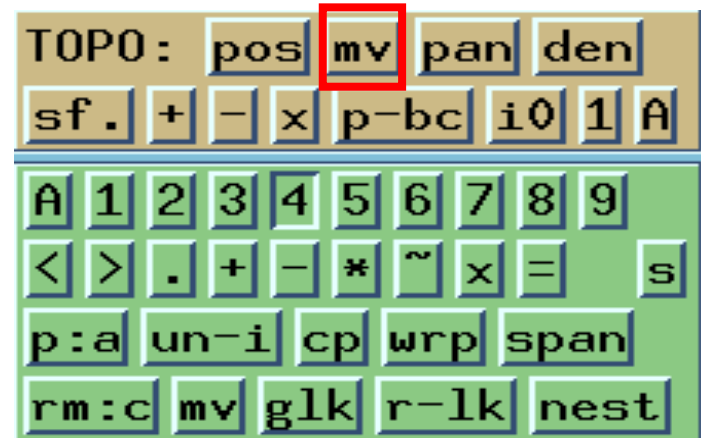


2. Move the Cut-Plane to the group using the group fit command

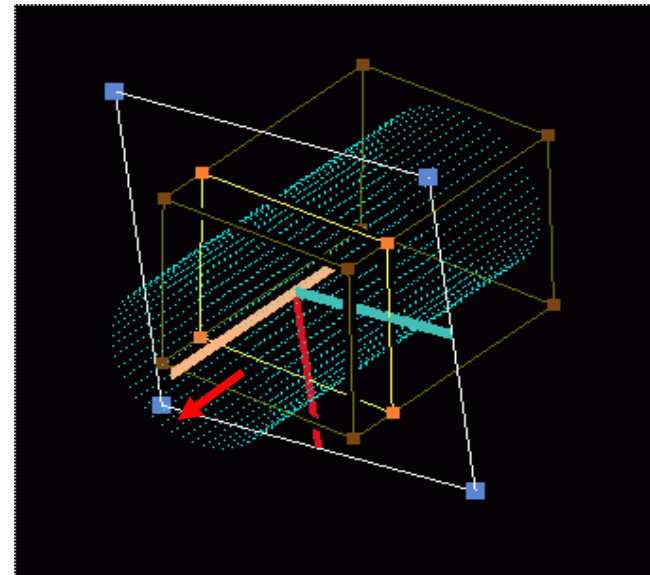


Contd...

3. Click on the move button

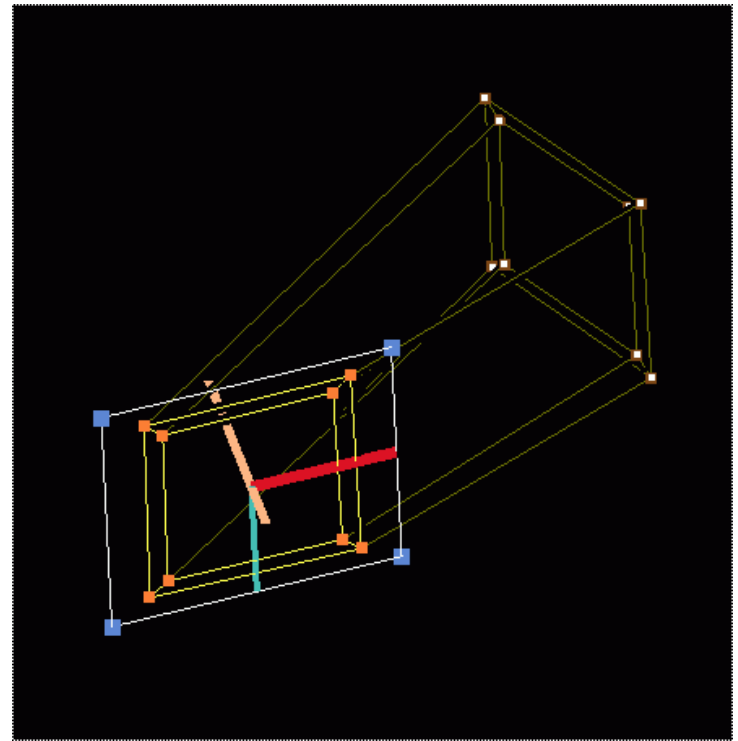
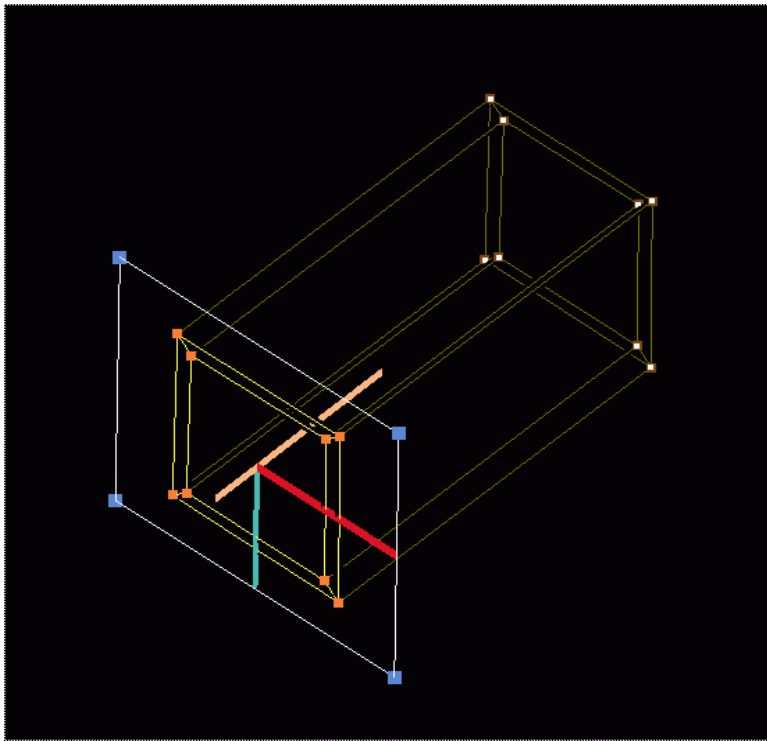


4. Move the topology by dragging the **Cut-Plane**



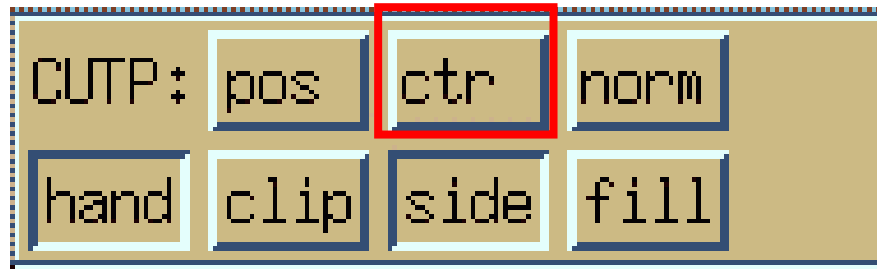
Rotating Topology

- Click on a desired axis of rotation and it will be un-highlighted
- Click center mouse button on cut plane axis, rotate it about axis of rotation



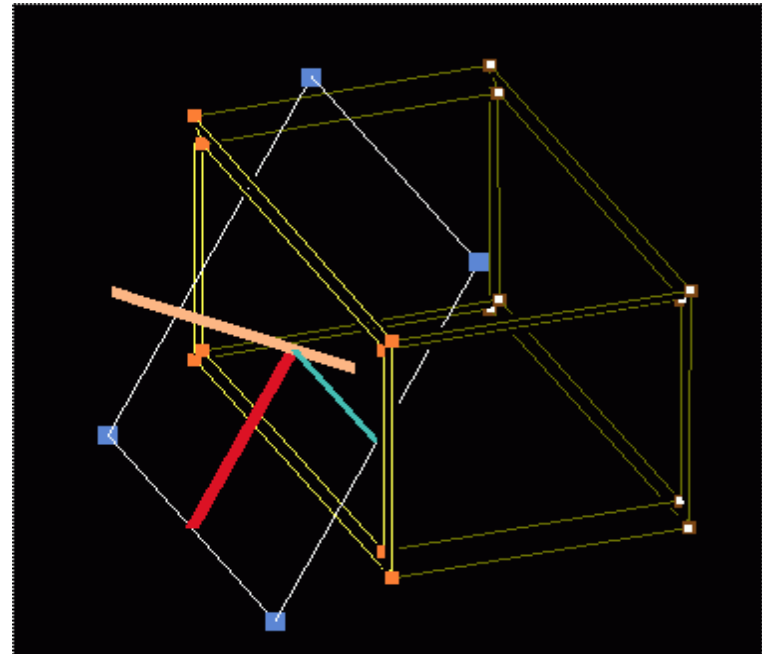
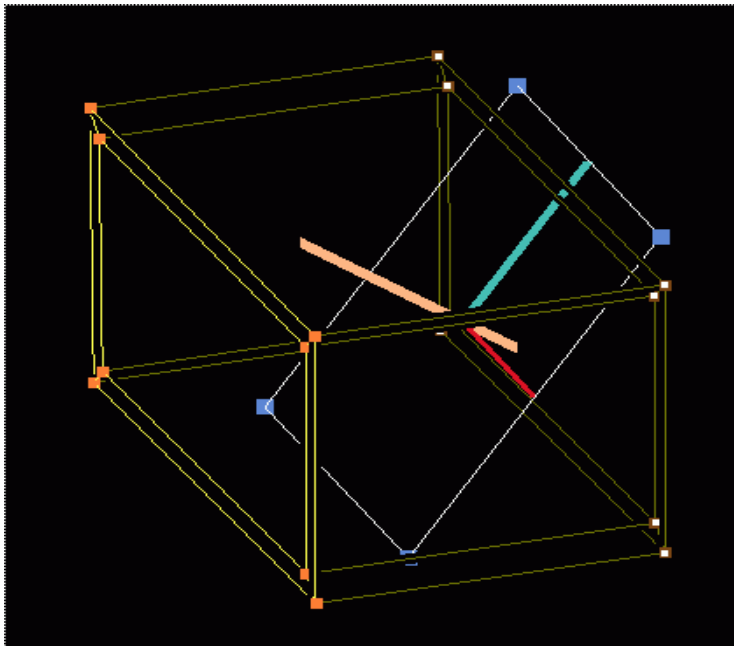
Moving Topology by Fitting Cut-Plane to Topology Group

- Use group fit command to move topology to center of mass of group

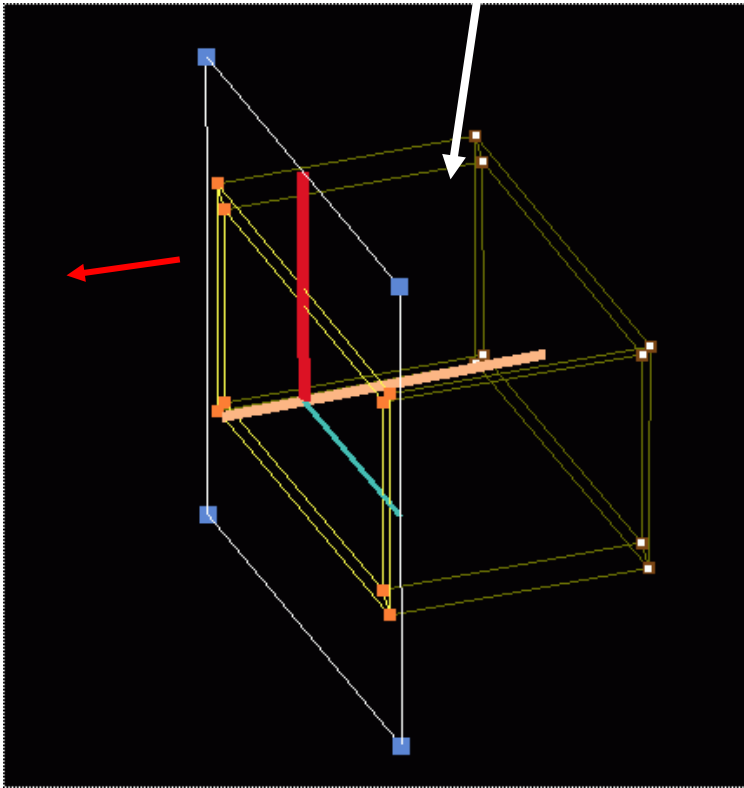


Position of Cut-Plane Axis

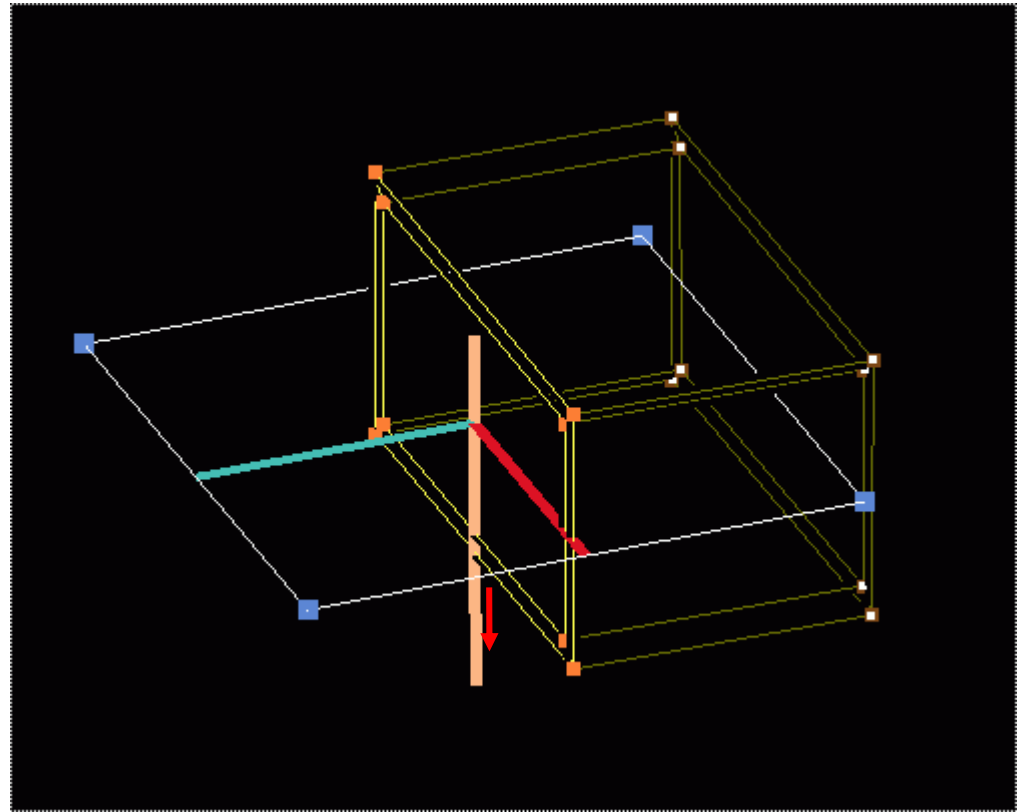
- The position of the Cut-Plane axis depends on the type of group fit and the direction you want to move the topology
- Always move the topology along the Cut-Plane Z-axis
- **ctr/group** moves the Cut-Plane to the center of mass only



Group fits 1 and 2

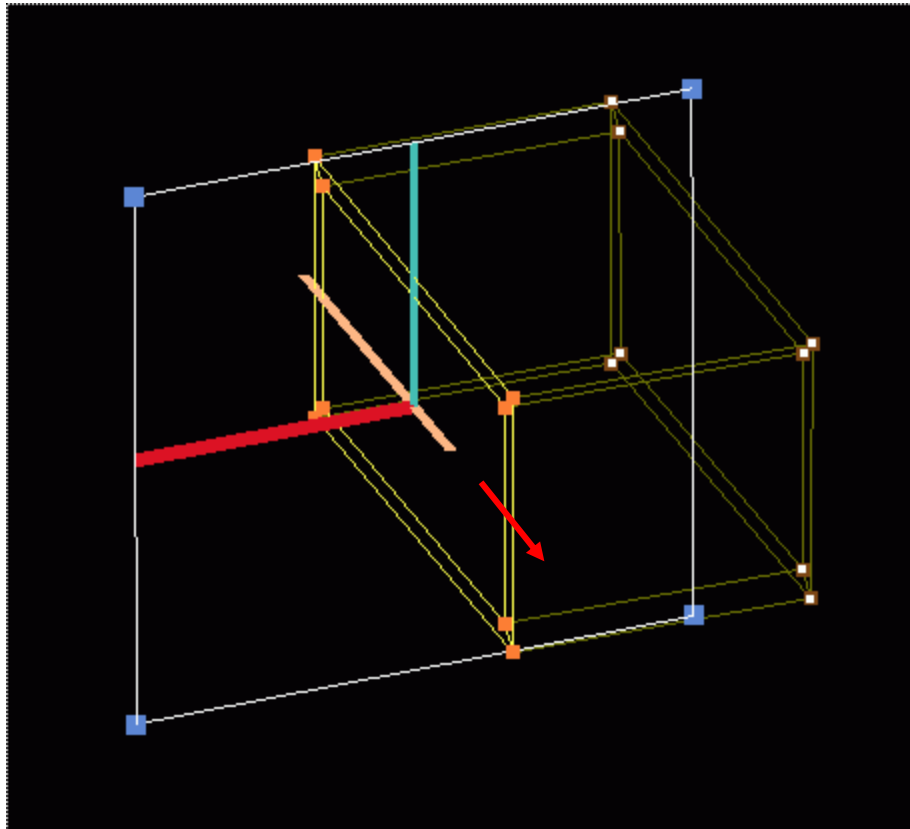


Group fit 1: Snaps the Cut-Plane Z-axis parallel shortest distance across topology



Group fit 2: Snaps Cut-Plane Z-axis parallel to intermediate distance of topology edge

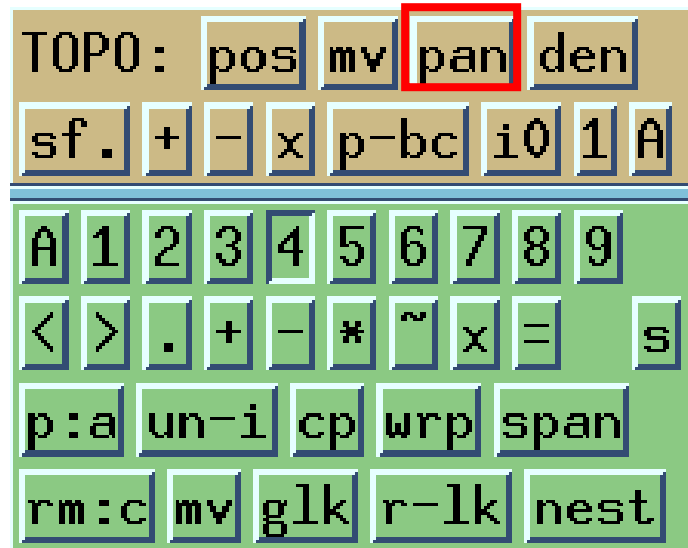
Group fit 3



Group fit 3: Snaps Cut-Plane Z-axis parallel to longest topology edge

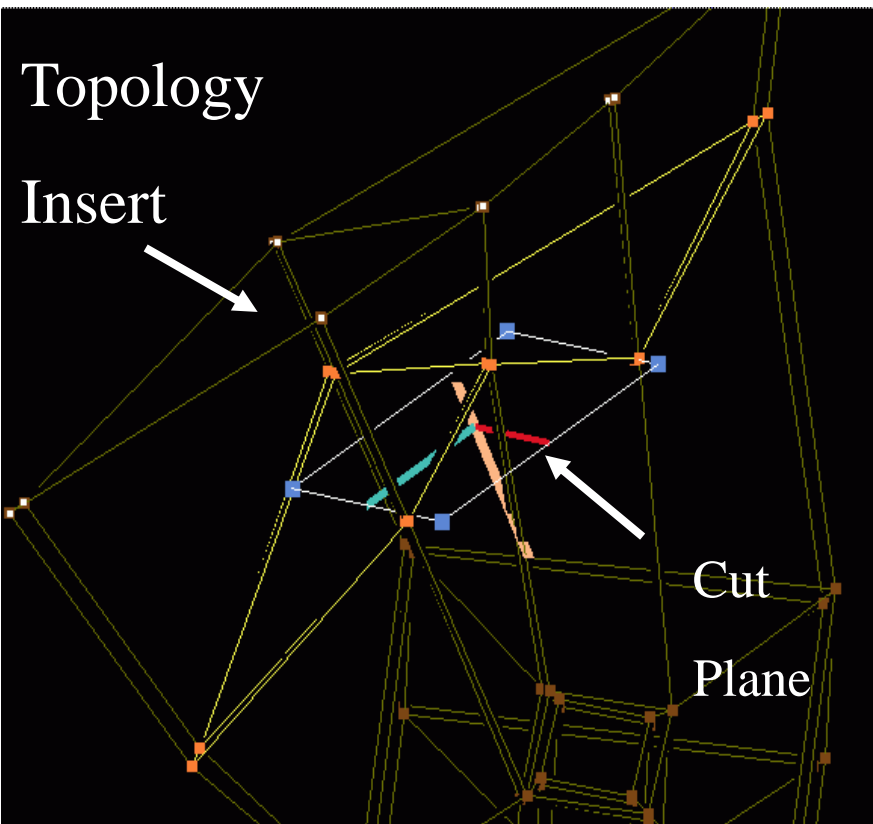
Pancaking

- Sometimes to keep topology organized it is good to pancake it to a cut plane or planer surface
- Put cut plane or surface into desired position and pancake using the **pan/pancake to cut-p** command

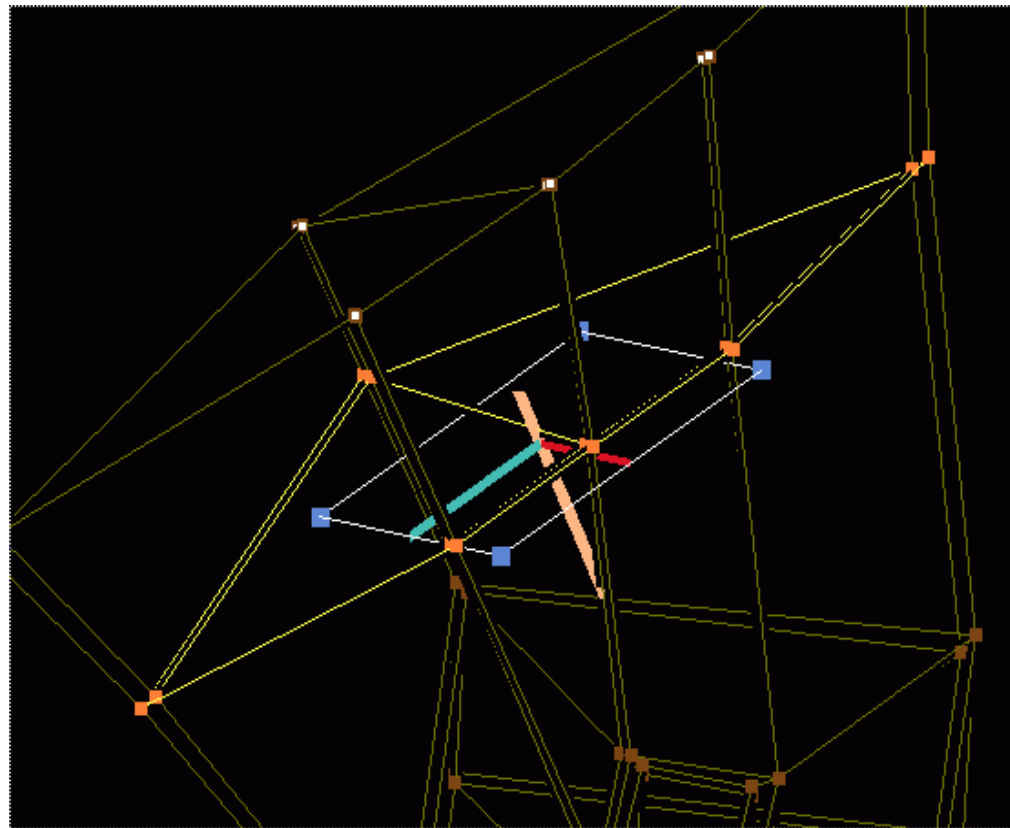


Contd...

Example: Pancake topology insert to cut plane



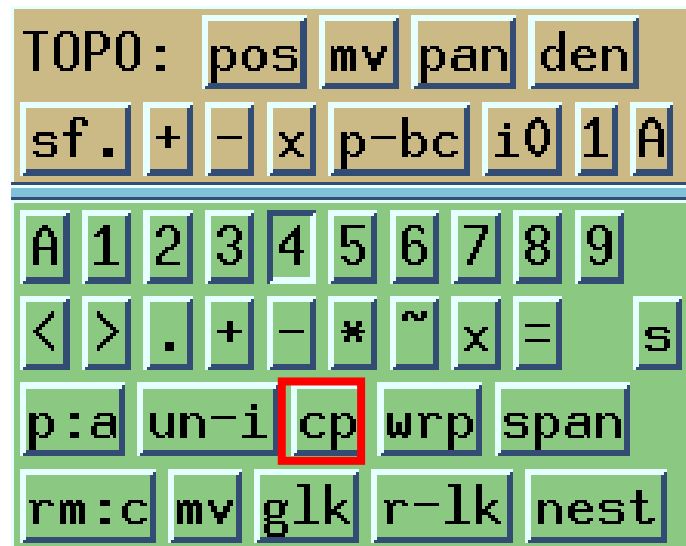
Center Cut-Plane on Topology sheet



Pancake Topology to Cut-Plane

Copying

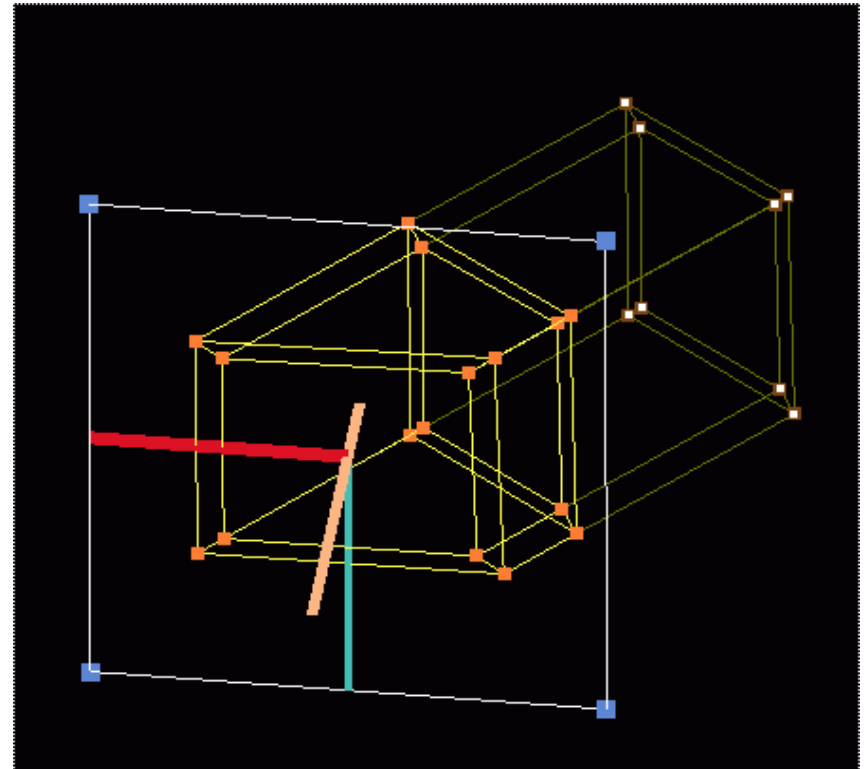
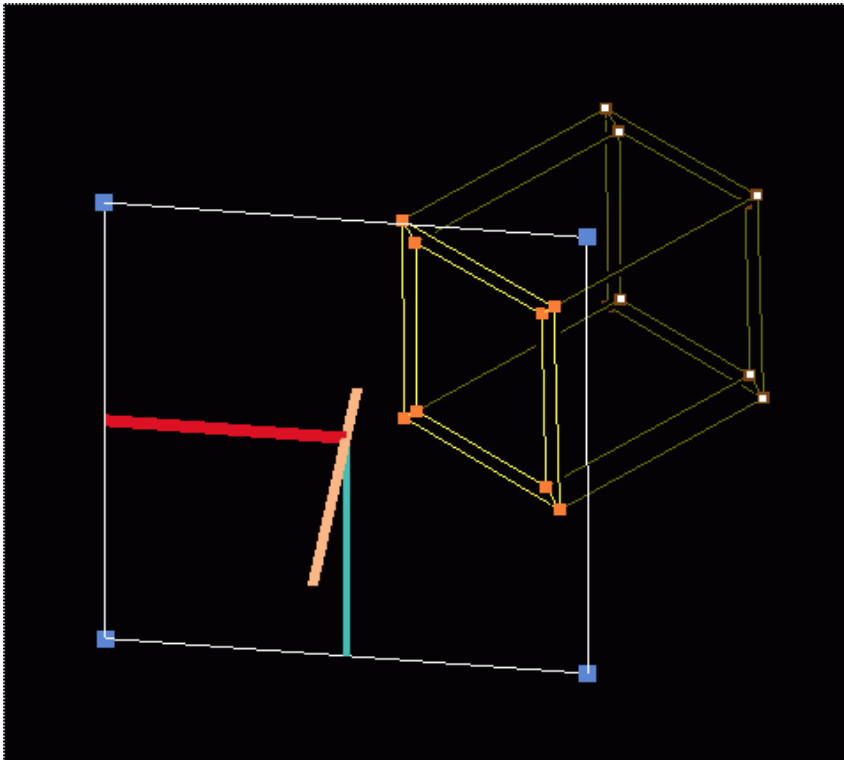
- It is very useful to copy the topology to the **Cut-Plane**
- Put **Cut-Plane** in desired location and copy by pancaking, drop back links or translation to Cut-Plane



Method 1: Pancake

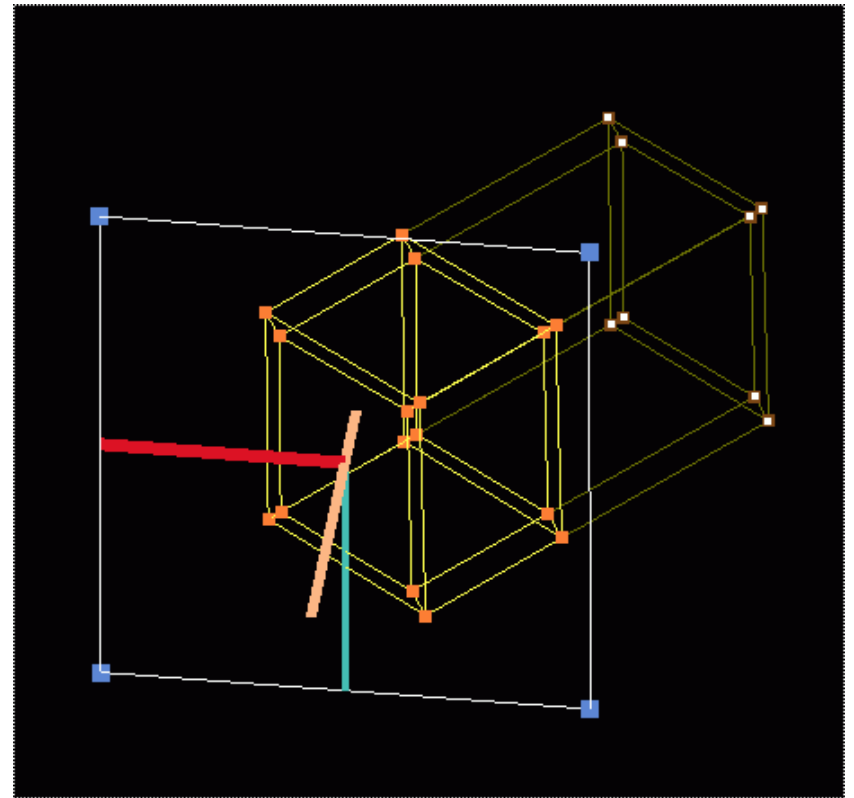
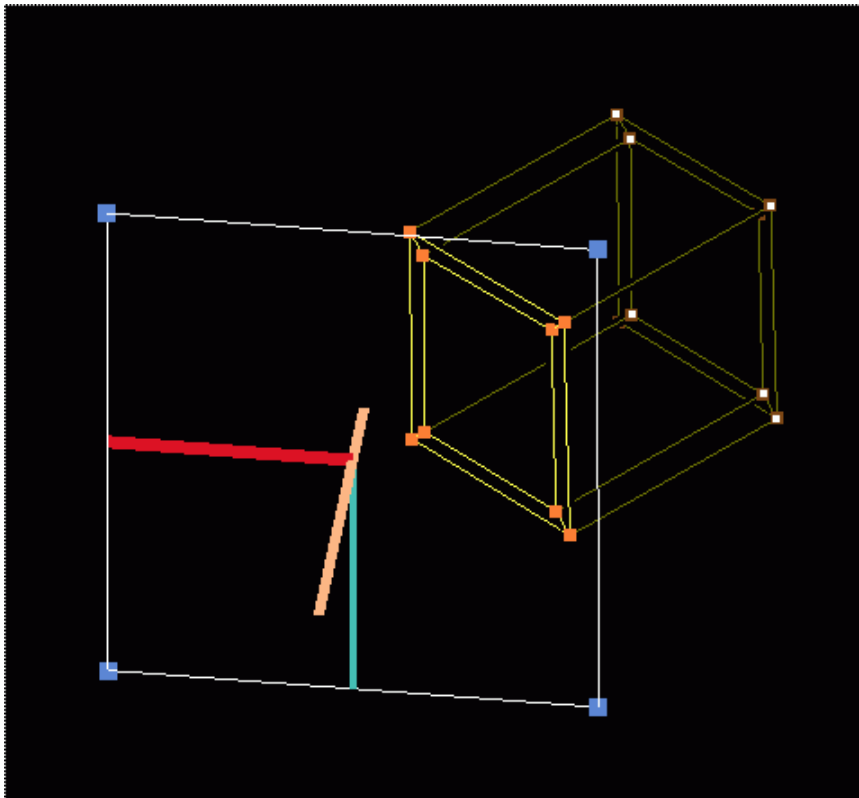
Step 1: Add topology to a group

Step 2: Choose **cp/pancake to cut-p** and the center of topology will be copied onto the cut plane axis



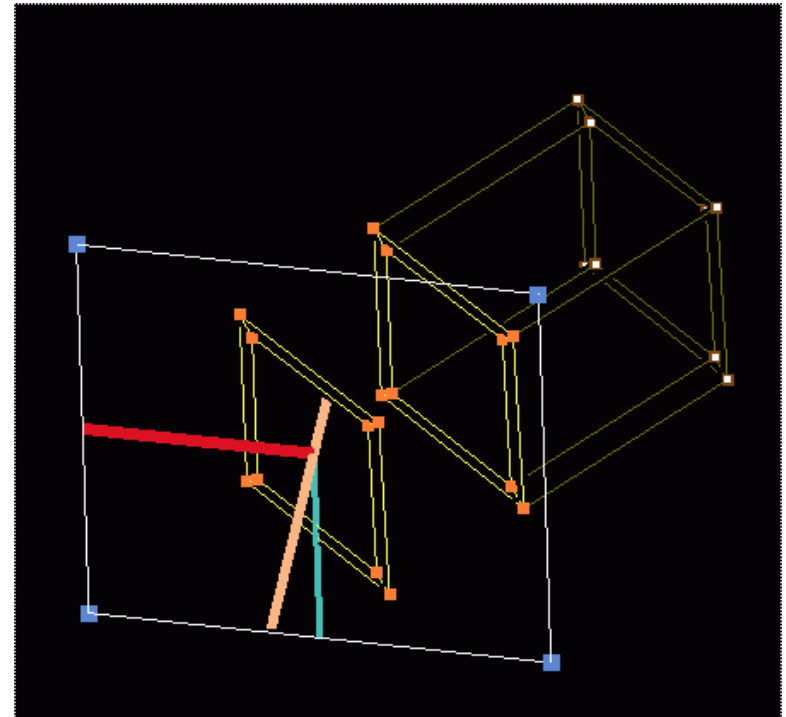
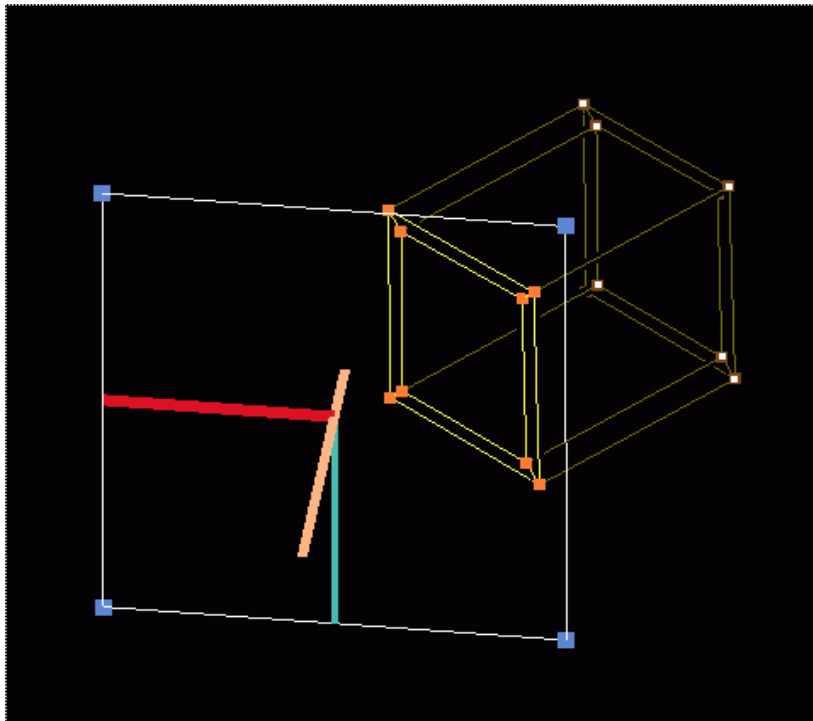
Method 2: Copy with Drop Back Edges

- **Step1:** Add topology to group
- **Step 2:** Choose cp/drop back edges



Method 3: Duplicate Topology

- **Step 1:** Add topology to group
- **Step 2:** Duplicate the topology to the **Cut-Plane** using **cp/translate to cut-p** command

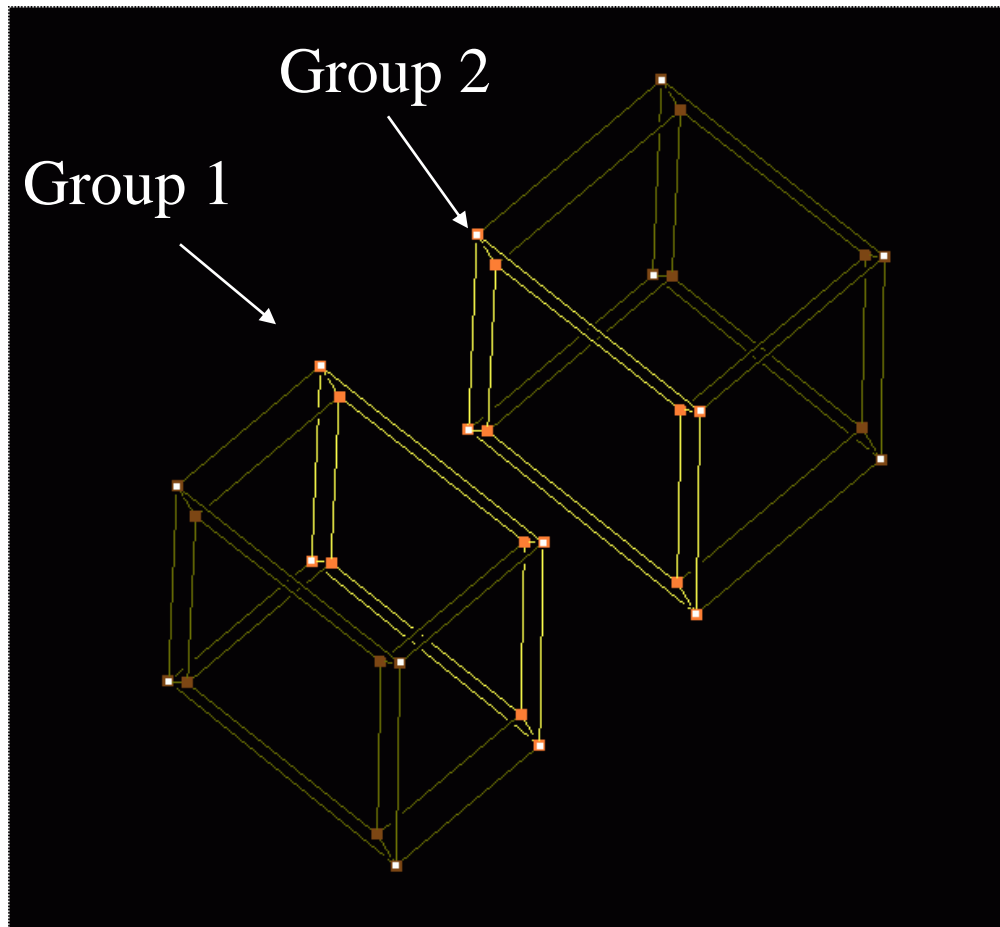


Linking Topology

- There are currently 3 ways to link topology in GridPro
 1. Linking two independent topology groups
 2. Merging two topology groups
 3. Automatically linking using the region link command
- Main Criteria: The interface of the two groups to be linked must be identical (equivalent number of points and edges)

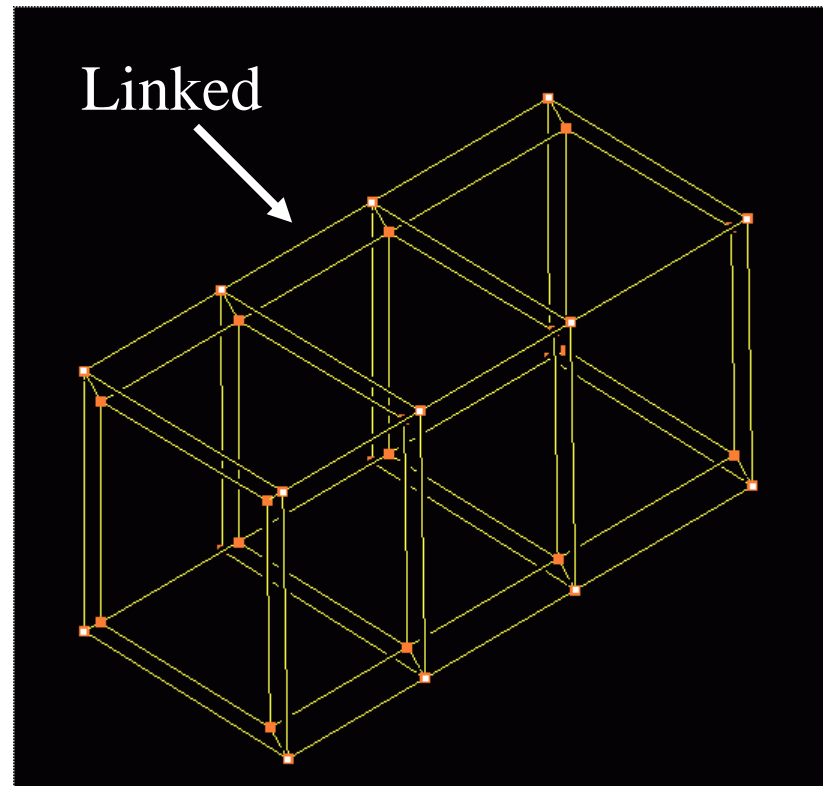
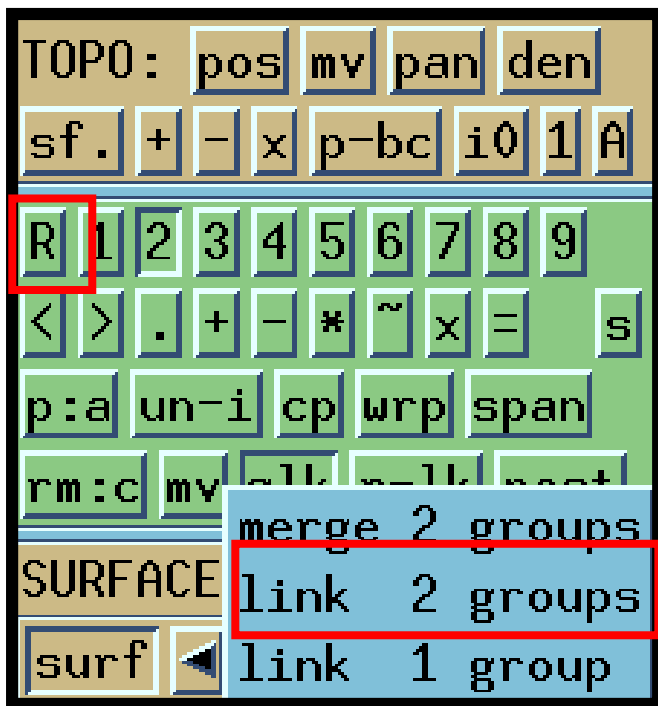
Method 1: Linking two independent topology groups

- Add one topology interface to **Group 1** and the other to **Group 2**



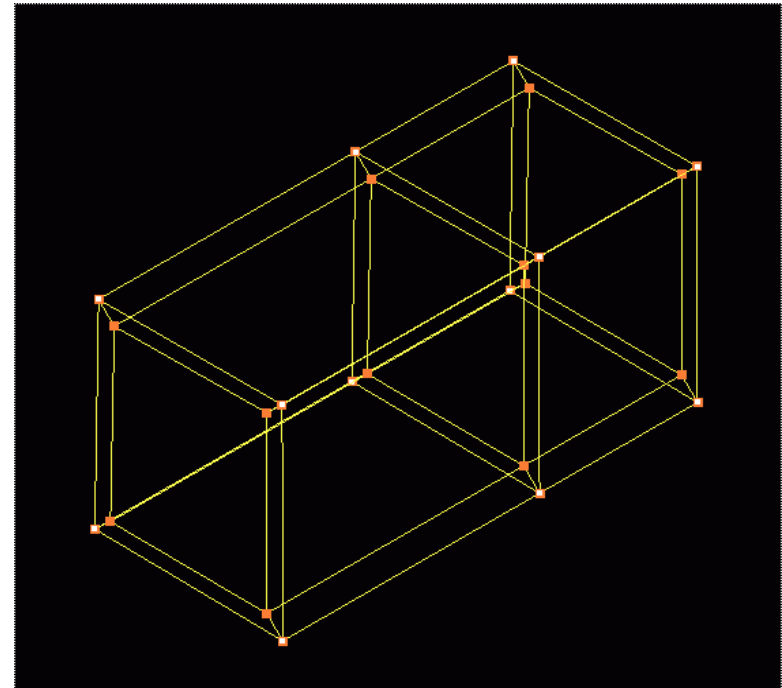
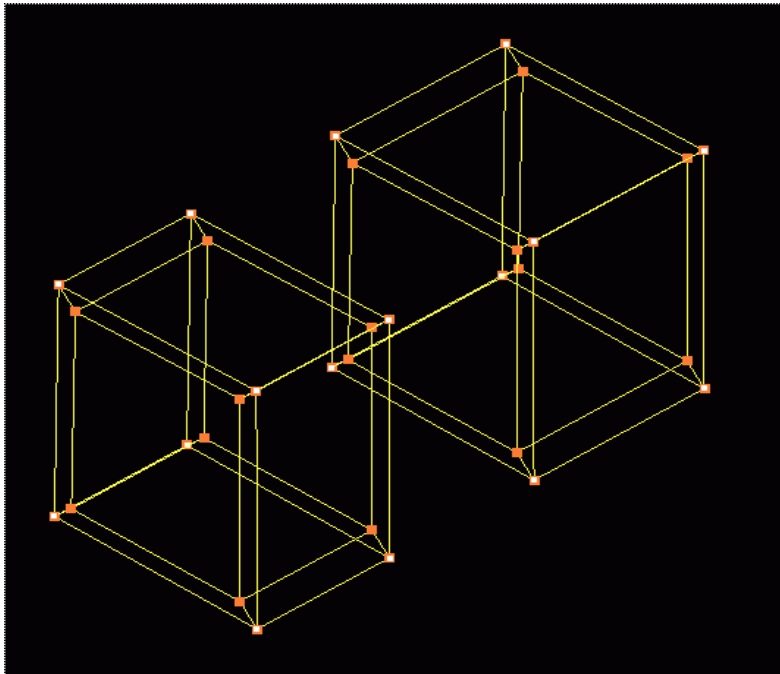
Contd...

- Click on **Group 2** and turn on the reference group <R> to the left of the group buttons
- Link by using the **g-lk/link 2 groups** command



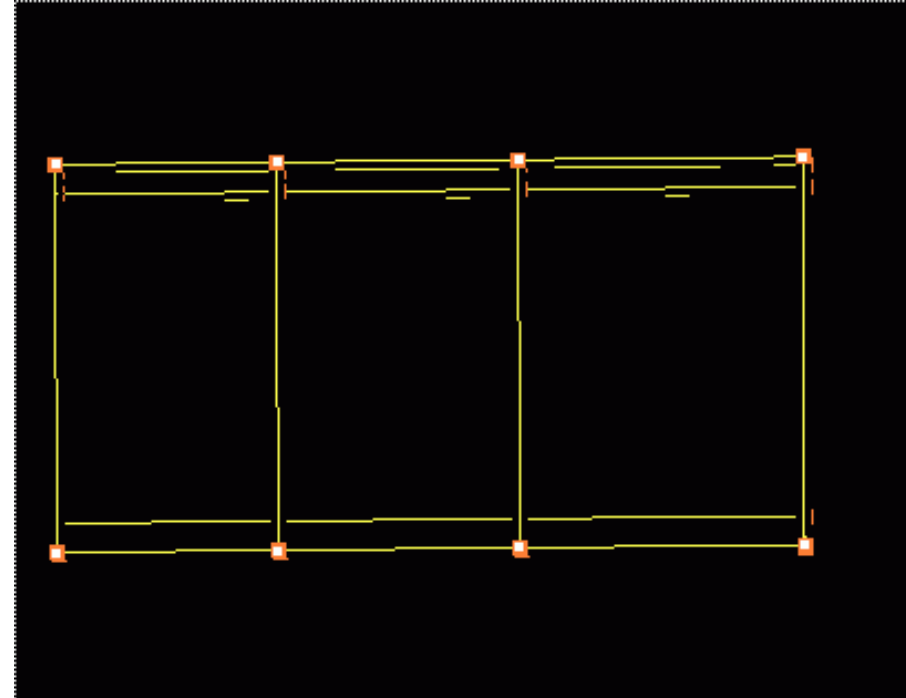
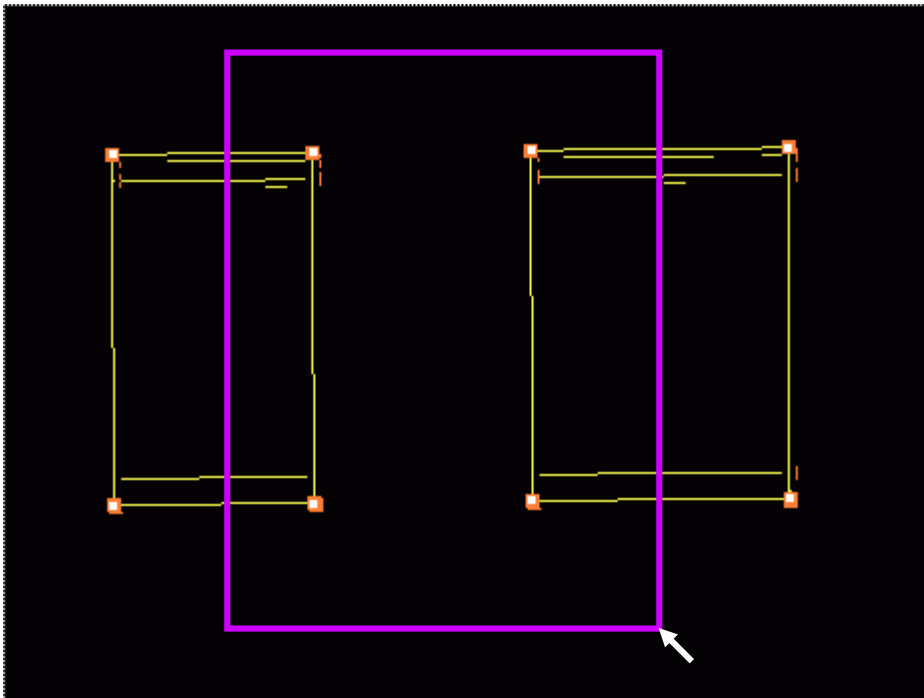
Method 2: Link by Merging Groups

- Same set up as **Method 1** but choose **g-lk/merge 2 groups** command
- **Group 1** is merged into **Group 2**
- Advantage: Reduces number of blocks in final grid



Method 3: Link using the Region Link Command

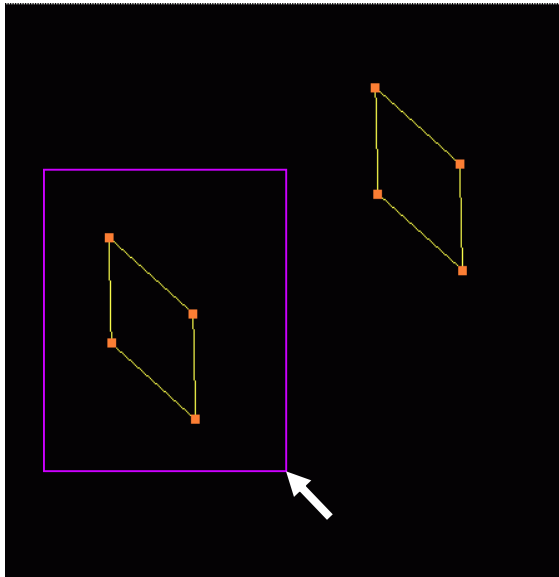
- You do not need to add the topology to a group
- Click on the **r-lk** button and then draw a box around the topology and it will be automatically linked



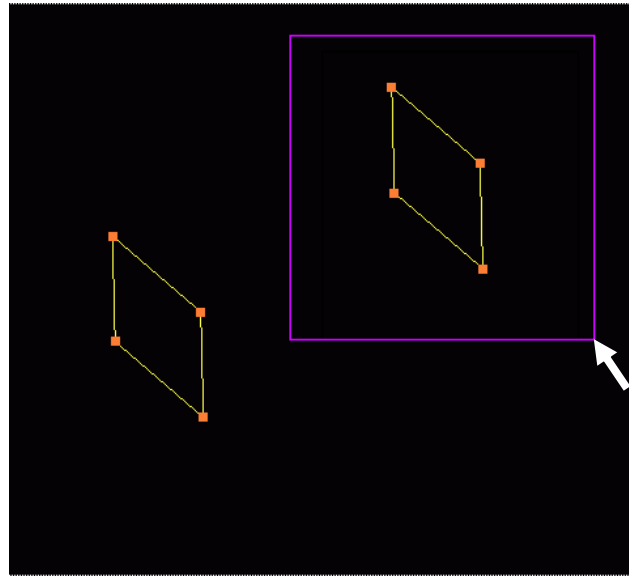
Contd...

- Linking using r-lk can also be obtained by choosing topology groups independently

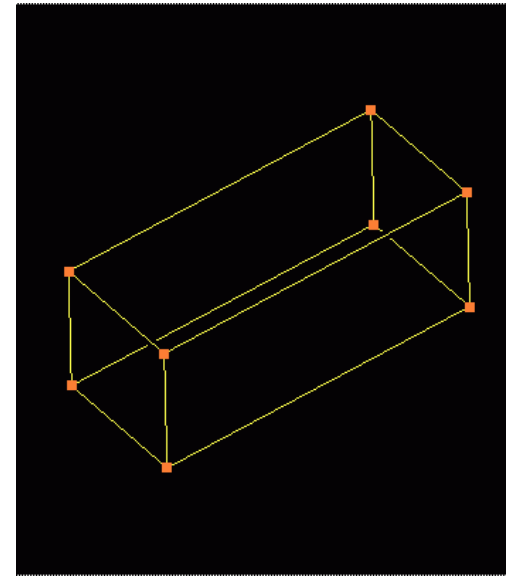
Example



Step 1



Step 2



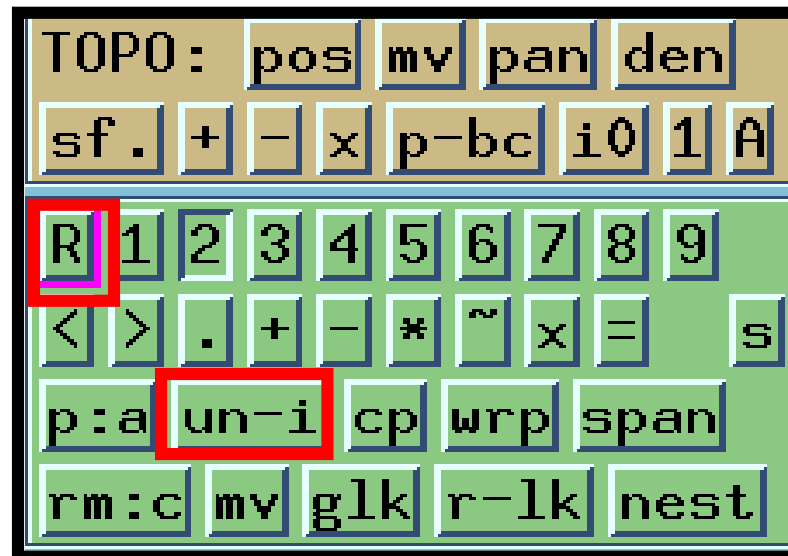
Topology
Automatically Linked

Uninsert Topology Sheet

- A topology sheet can be uninserted at any time using the uninsert command.

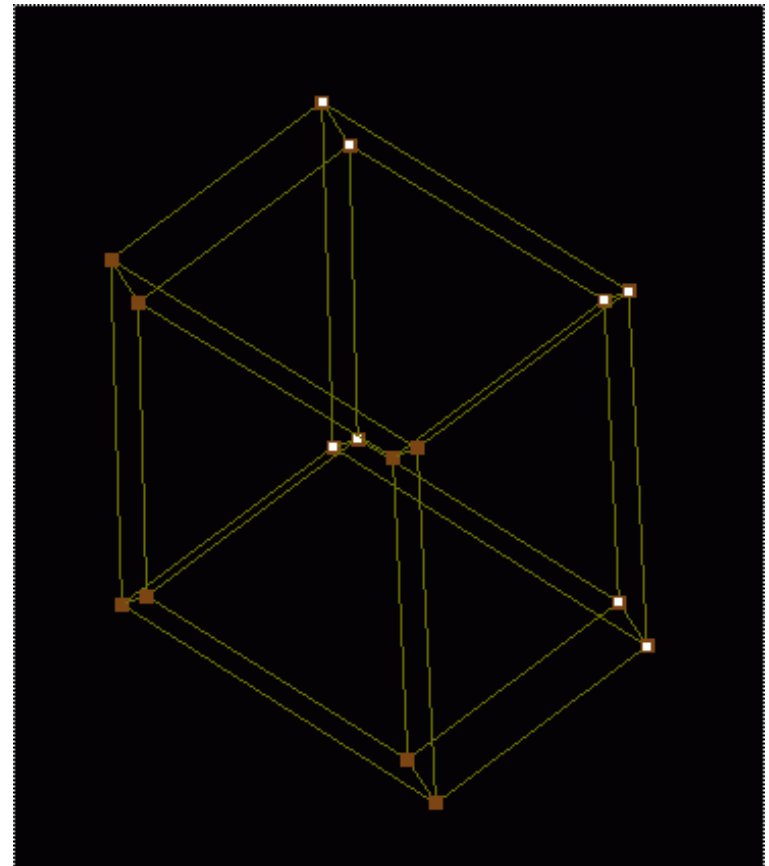
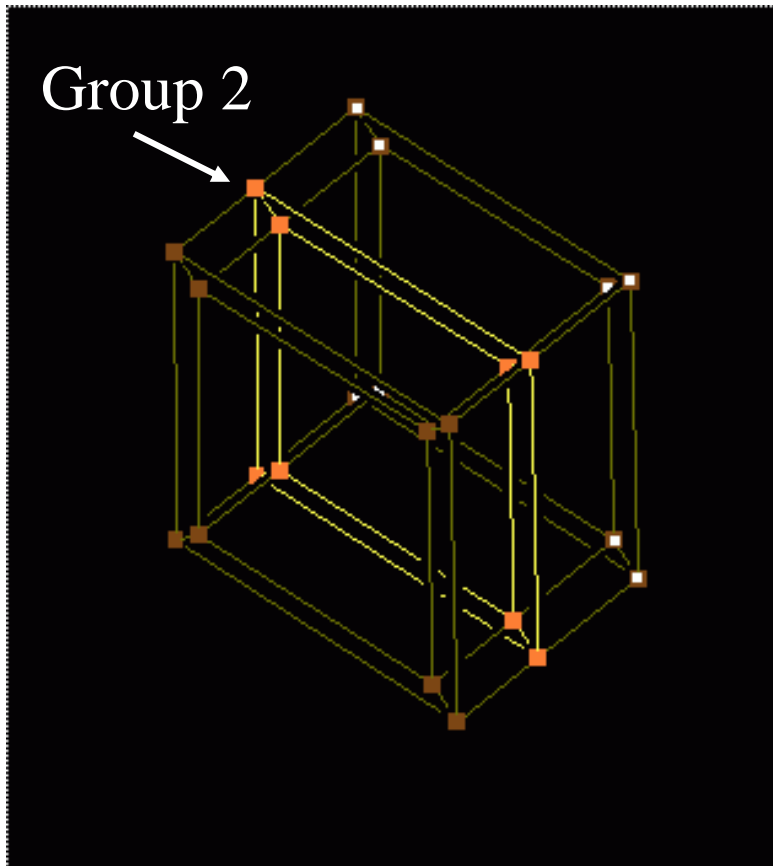
Step 1: Add all of topology to **group 1**

Step 2: Add topology sheet to **group 2**, turn on reference group <R>



Contd...

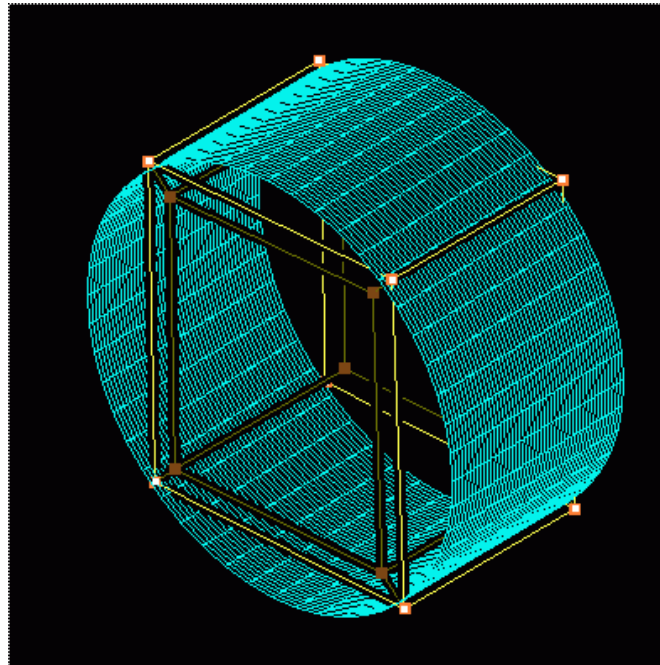
Step 3: Click on the un-i button



Peeling Back Wrap

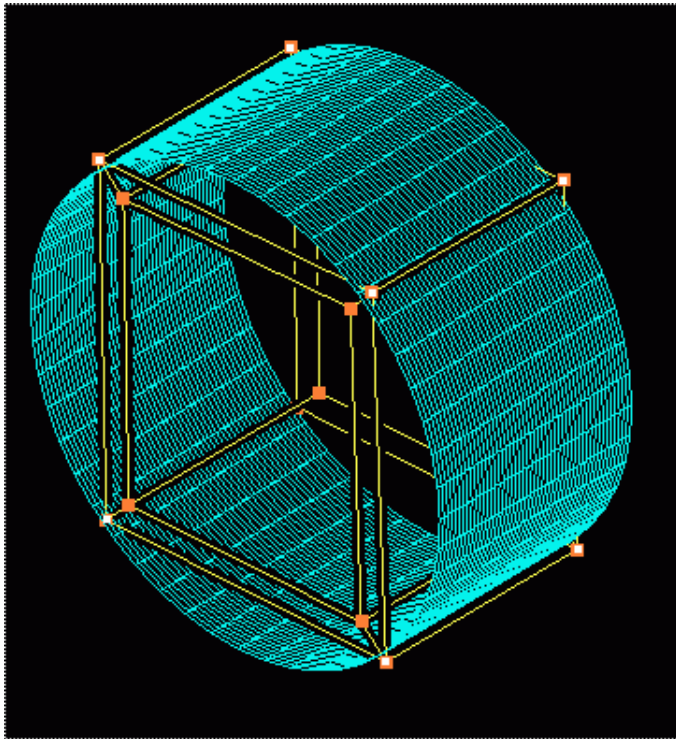
- You may want to make edits to the topology and wrap again
- Save time by maintaining wrap group

Step 1: Turn on current surface and add assigned wrap group <s> to new group by clicking on group, <+> and then <s>

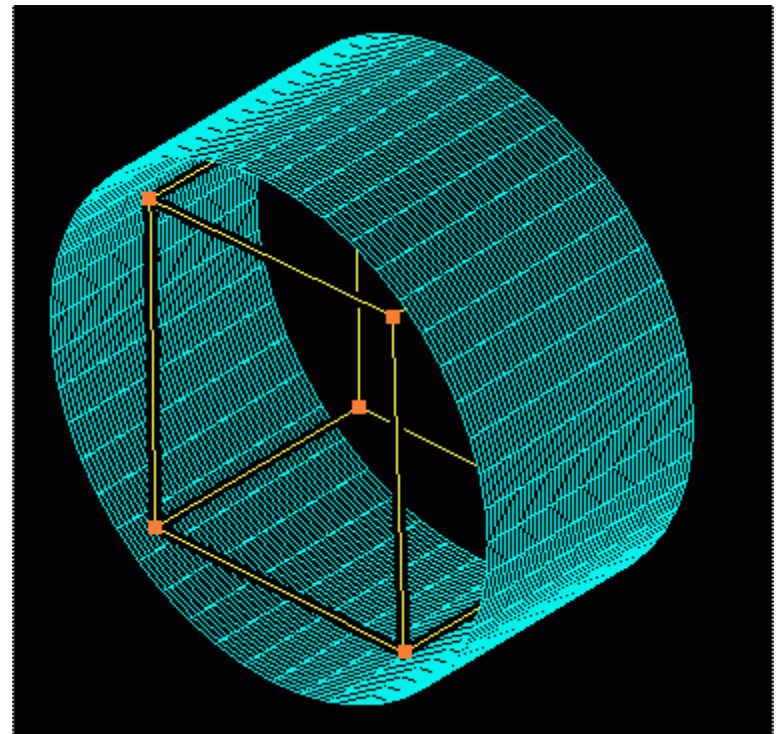


Contd...

Step 2: Peel back one layer by choosing **span/span out 1 layer** from the **TOPO** Menu



Step 3: Click on the <s> button again to highlight only the wrap, remove the wrap by holding down the R key on the keyboard and drawing a box around the topology with the right mouse button

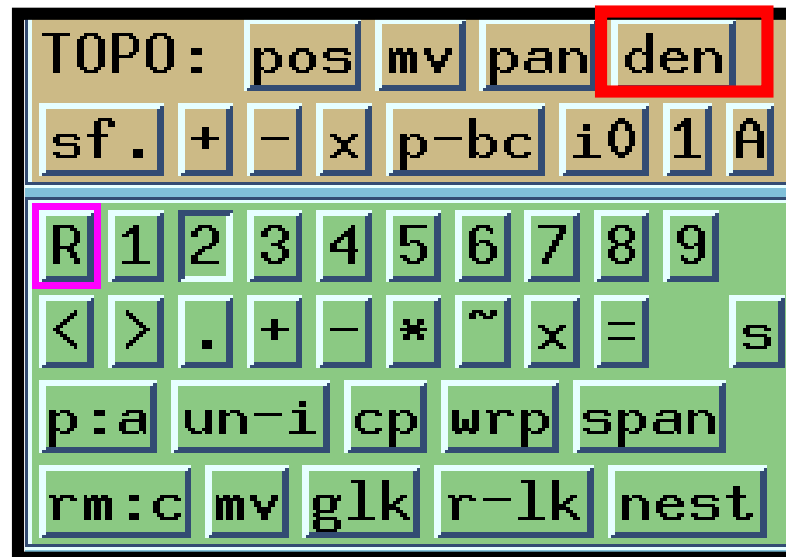


Density

- The density of an edge can be changed anytime using the 'Density' command.

Step 1: Click on the 'den' button

Step 2: Click on the edge whose density has to be changed



Contd...

Step 3: Enter the new density value in the 'new den:' option and click apply to set the new density for the selected edges

