AUTODESK UNIVERSITY 2013

Flowing between Alias, Inventor, and Simulation CFD

Anthony Dull – Imaginit Technologies

MA1655

Ready - Conceptualize, Set - Design, Go - Simulate

Learn how to transition from Alias to Inventor and finally Simulation CFD. Change happens, so when it does how does this workflow get affected?

Learning Objectives

At the end of this class, you will be able to:

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- Use Alias to create conceptual design.·
- Complete conceptual design in Inventor.·
- Take Inventor model into Simulation CFD for analysis.·
- Change happens, now what?

About the Speaker

Anthony Dull is a Senior Applications Expert with IMAGINiT Technologies. His proven expertise in manufacturing and design as well as, modeling and analysis technologies makes him an invaluable instructor for organizations undergoing specification, implementation, training, and support phases of technology adoption.

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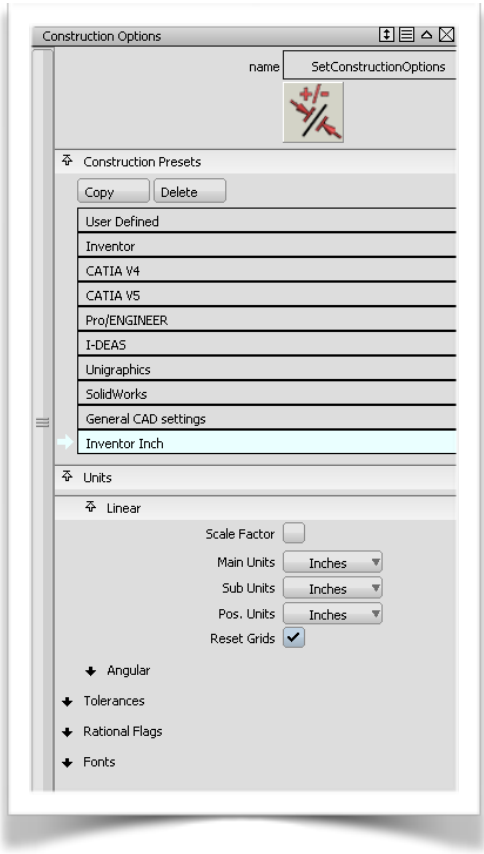
Class Summary

Learn how to transition from Alias to Inventor and finally to Simulation CFD. Change happens so when it does how does this work flow get affected?

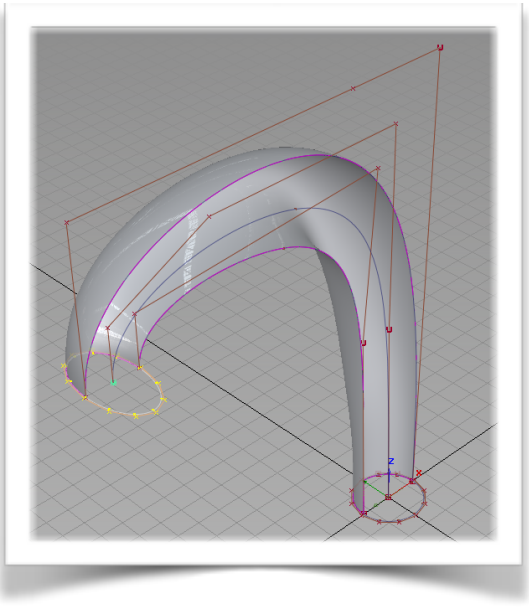
Use Alias to create conceptual design.

Settings within Alias

1. Preferences -> Construction Options
   A. Setting the construction options for the proper CAD applications will ensure the maximum compatibility with that CAD package.

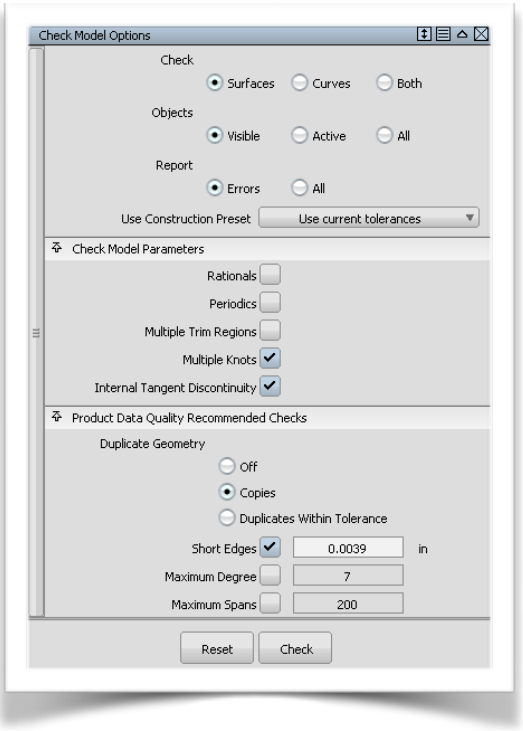


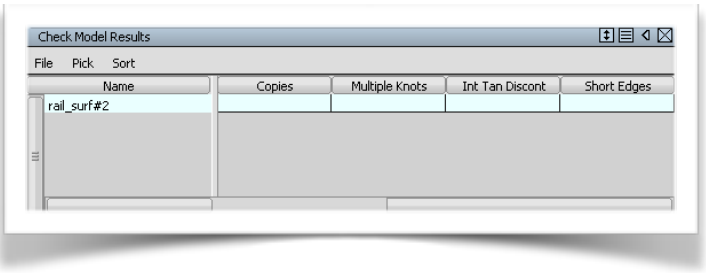
Design conceptual model



Checking Surfaces for problematic conditions

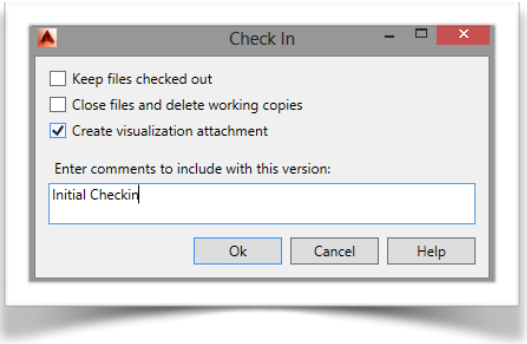
1. Palette > Evaluate > Check model (check model settings)
   A. To ensure the validity of the surfaces prior to importing into Inventor evaluate the surfaces.





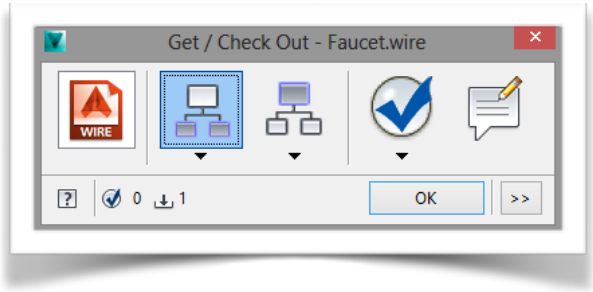
Checking in the design to Vault

1. Vault will act as the single source of truth through out the design process. From concept to simulation.



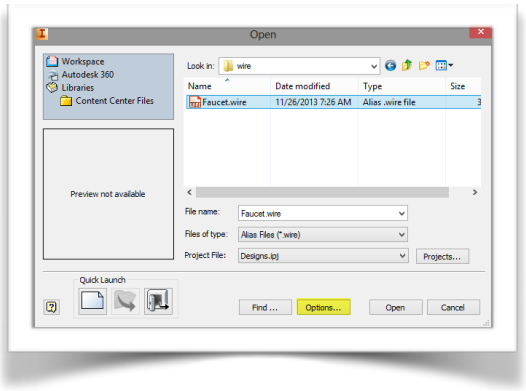
Complete conceptual design in Inventor.

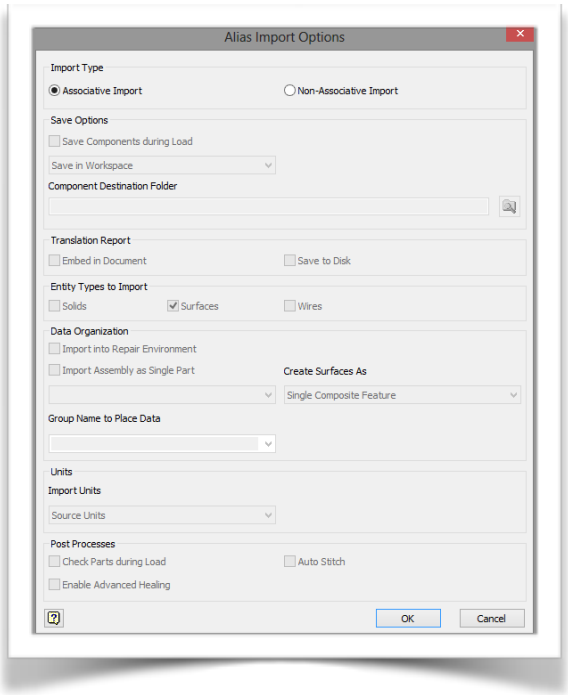
Get Alias file from Vault



Opening .wire file in Inventor

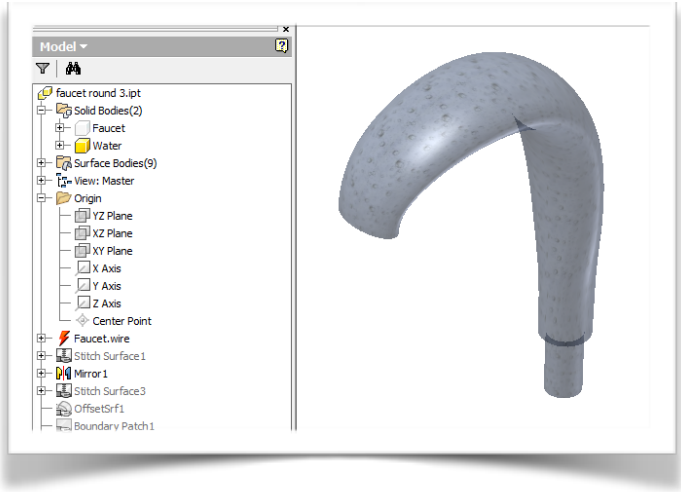
1. Verify options prior to opening
   A. Associative import - will maintain associativity between the inventor file and the Alias source file.
   B. Non-Associative import will import file without associativity.



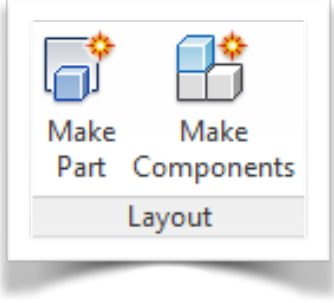


2. Once the file is opened
   A. Convert into Solid
      1. Stitch, Thicken, Sculpt.....
   B. Add Inventor Features as required to complete design.

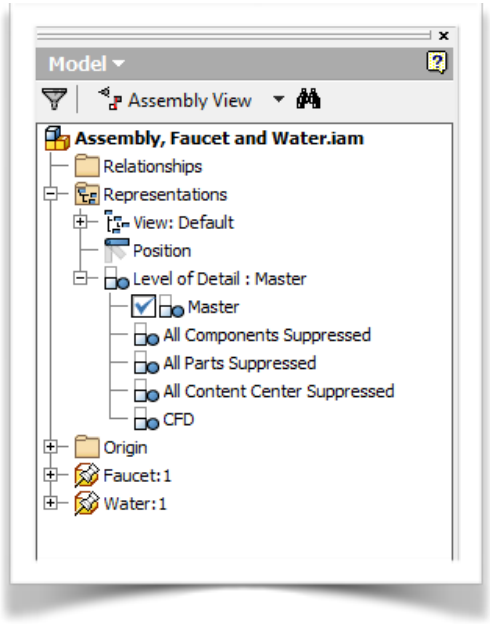
3. Create volumes for CFD using Solid Bodies (optional)



4. If Solid Bodies were used to create water volume then use Make Components to create an assembly of faucet and water volume.

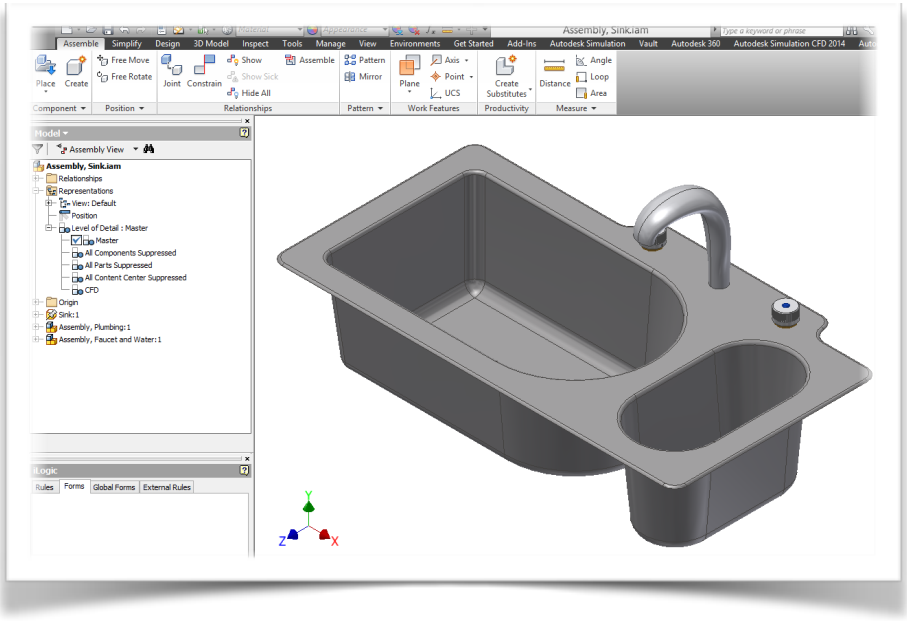


5. Create a Level of Detail called "CFD" within that assembly leaving only the water volume.



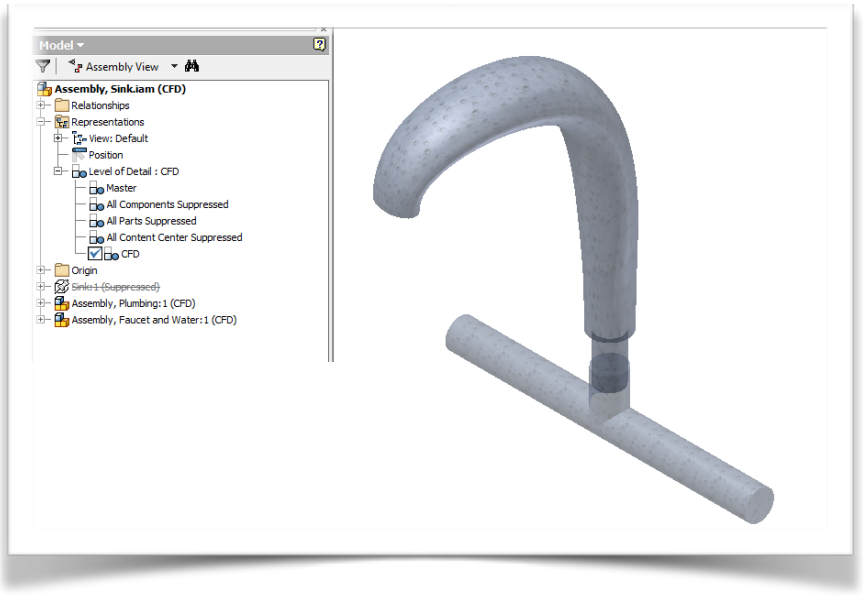
Place faucet model into Inventor assembly

1. Create volumes for CFD (optional)

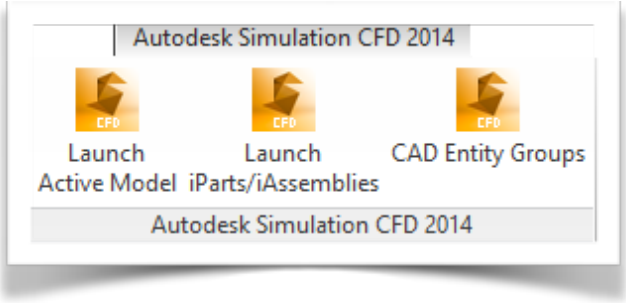


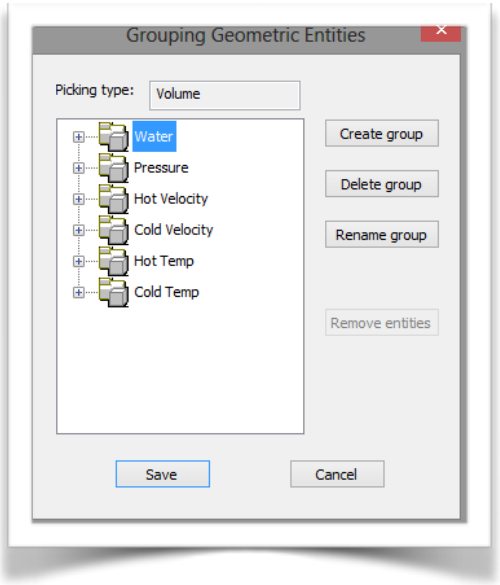
Inventor model for CFD

1. Create a LOD to simplify the inventor model leaving only the required water volumes.
   A. Alternately the water volumes can be created within CFD.

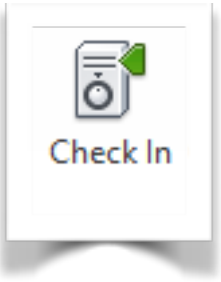


2. Add CAD Entity Groups specifying the required volumes and surfaces to aid in the transition into CFD. (Optional step)

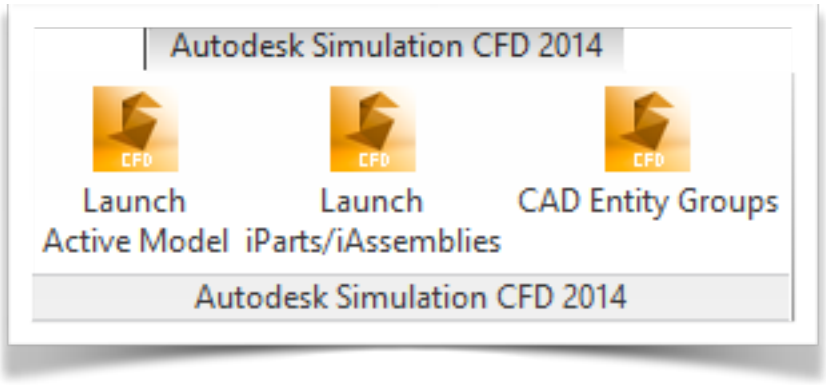




3. Save and Check in file (If someone else is doing the CFD)

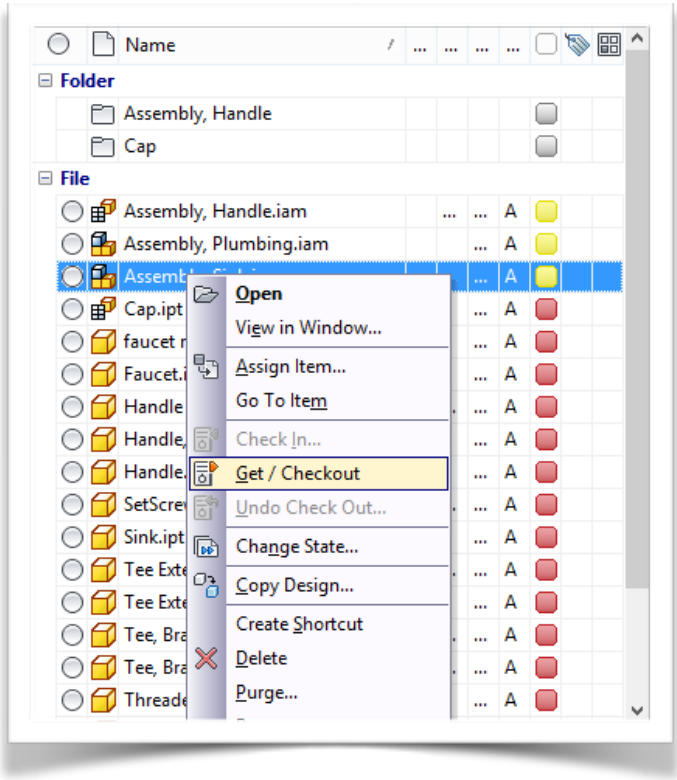


4. Send to CFD (If you are doing the work)



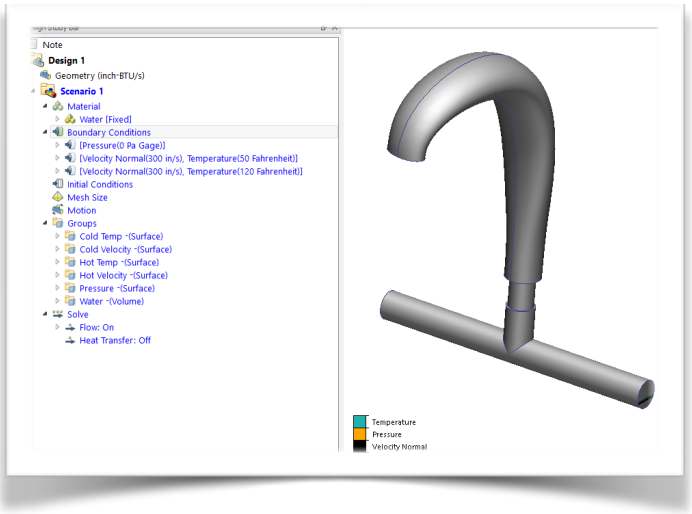
Take Inventor model into Simulation CFD for analysis.

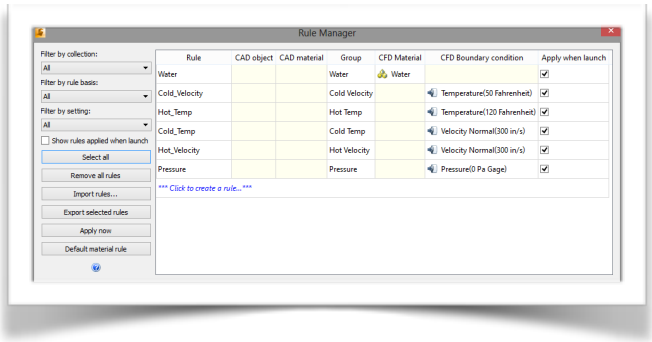
Get the Inventor files from Vault



Finish setting up CFD design

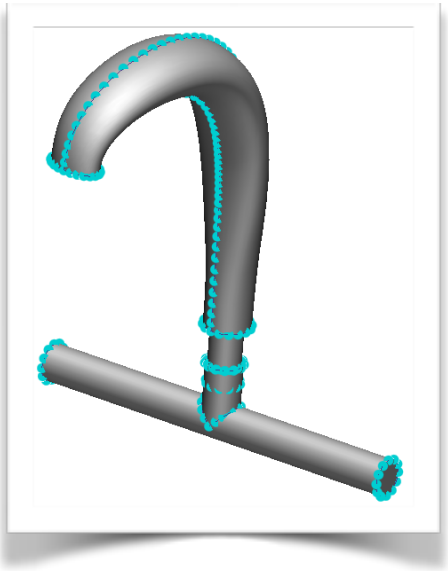
1. Manually assign Materials, Conditions, Forces…. (If they were not set within Inventor)
2. Automatically assign materials, conditions, forces based in the Cad Entity Groups



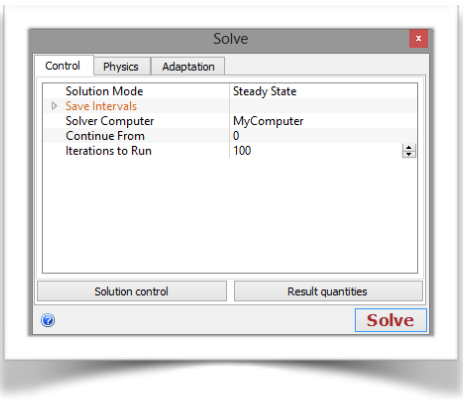


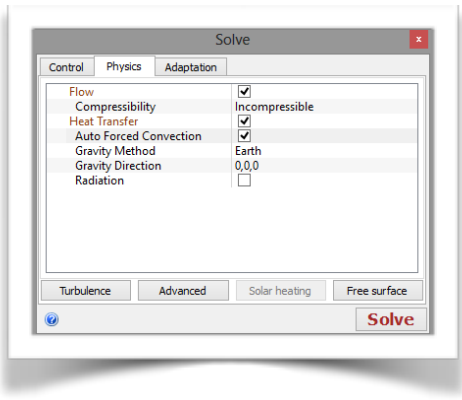
Preparing to solve

1. Apply meshing

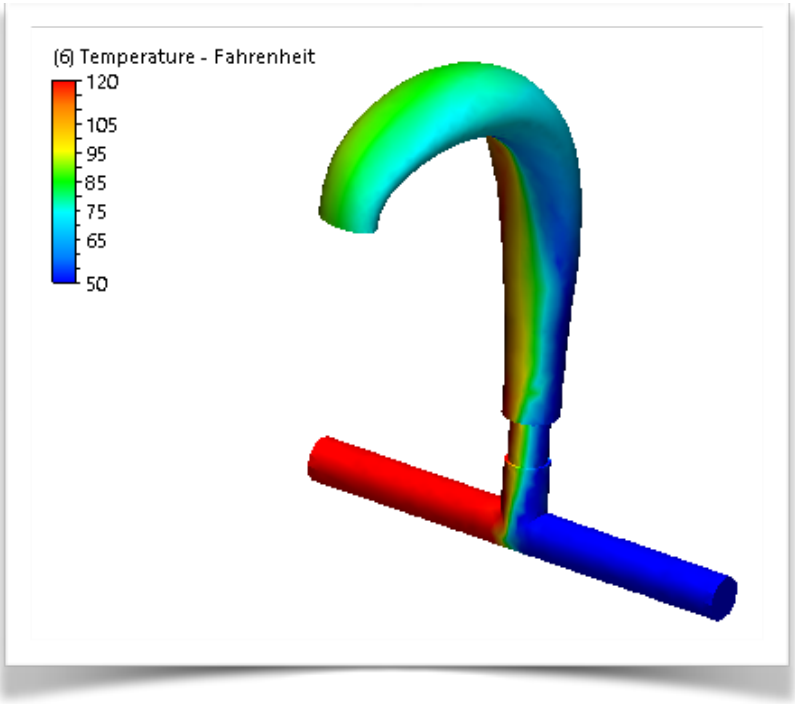


2. Configure solve dialog box

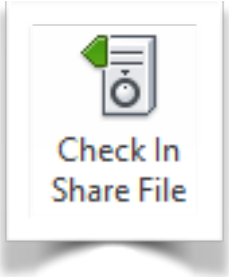


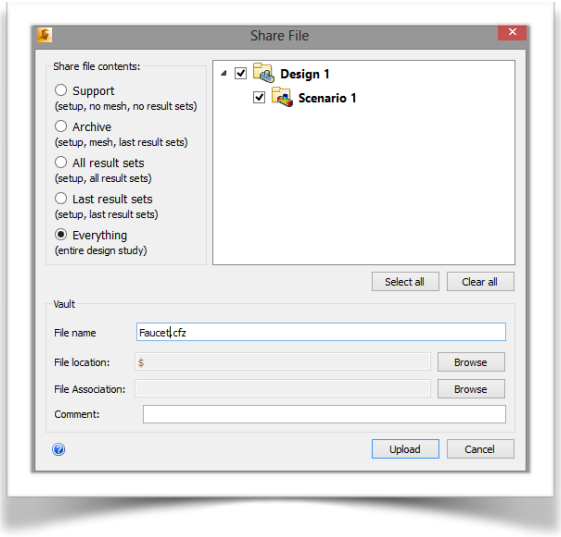


3. Solve and add required scenarios to the Decision Center.



Check in the design to Vault

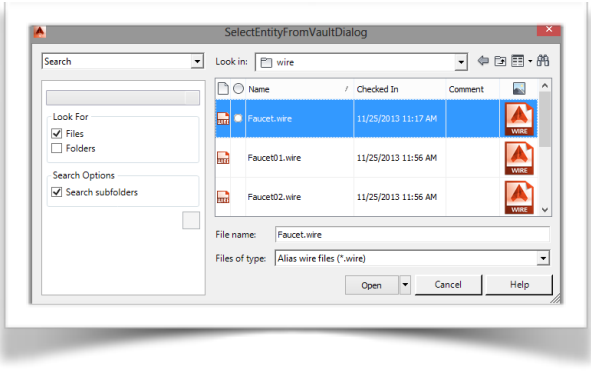




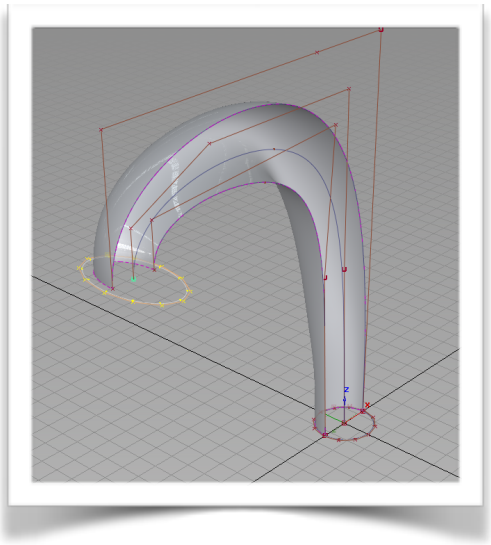
Change happens, now what?

Back in Alias - Check out the design from Vault

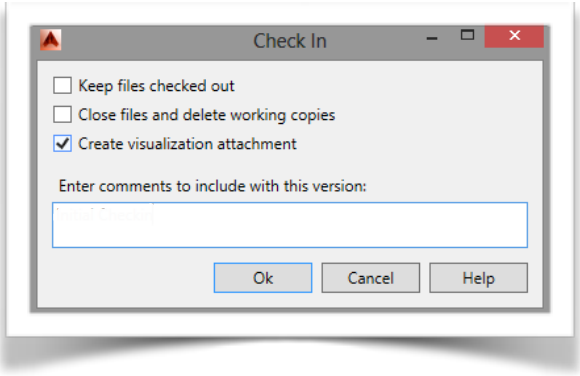
1. Ever have a boss / customer change their mind?



2. Make required changes

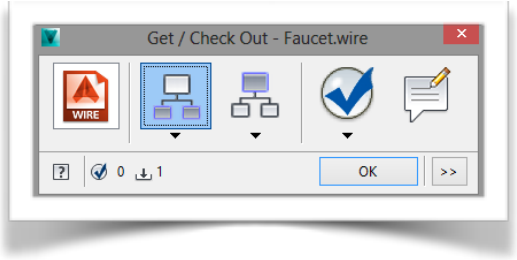


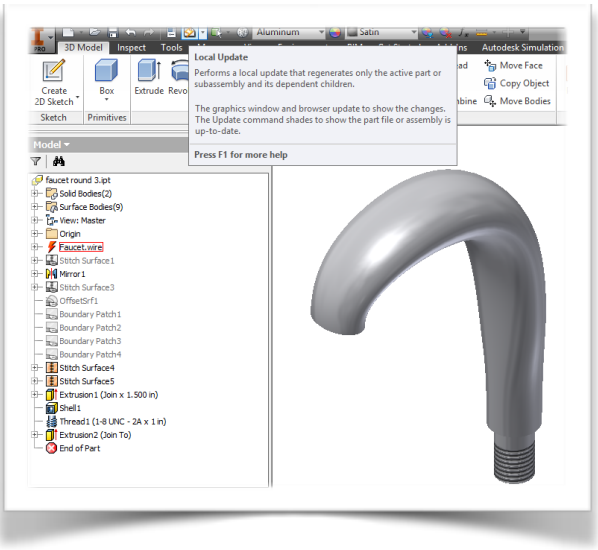
Check in the design to Vault



Back in Inventor - Check out the Inventor files from Vault and get the revised Alias file

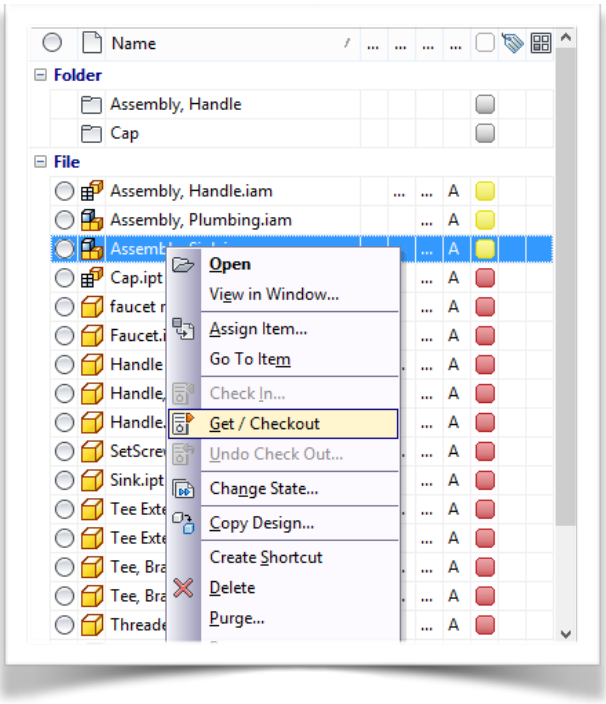
1. Update Inventor files (Parts and Assemblies)





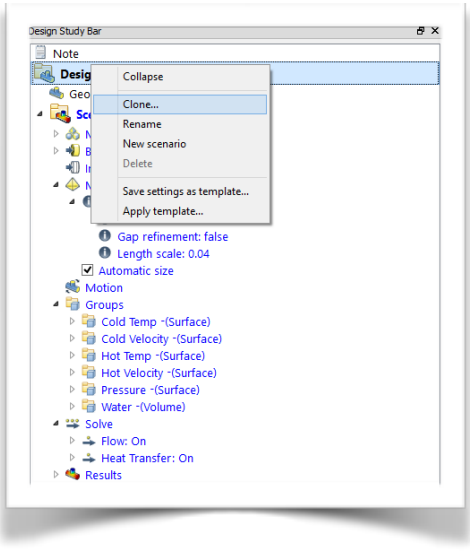
Check in the design to Vault

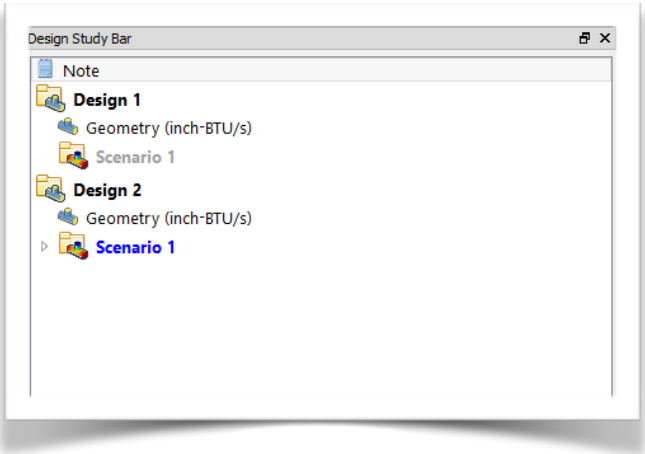
Back in CFD - Get the required Inventor files from Vault



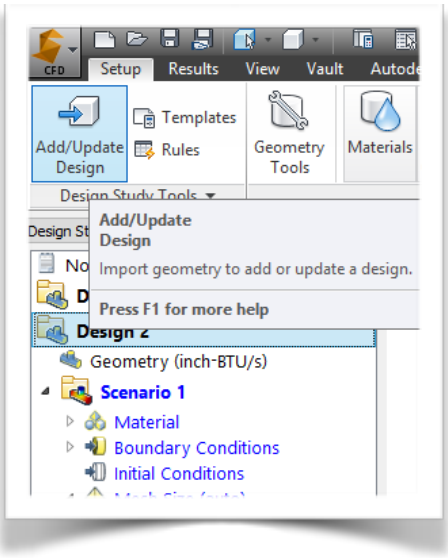
1. Clone the original Design 1 and create a Design 2

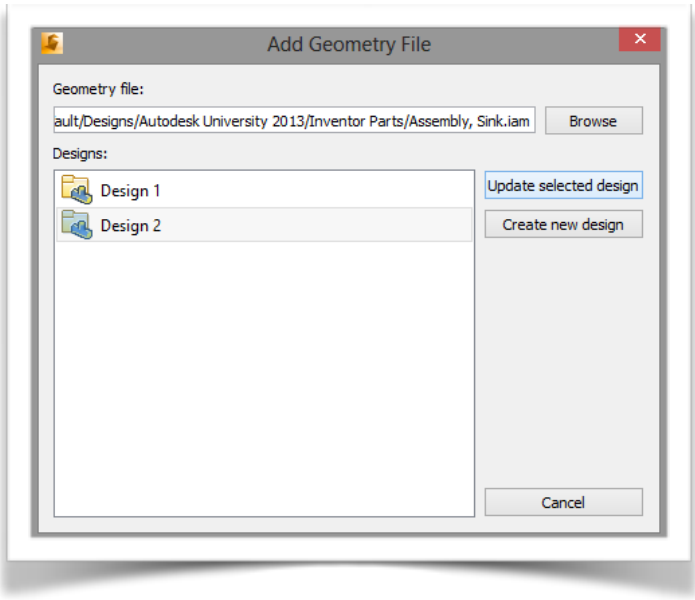
1.



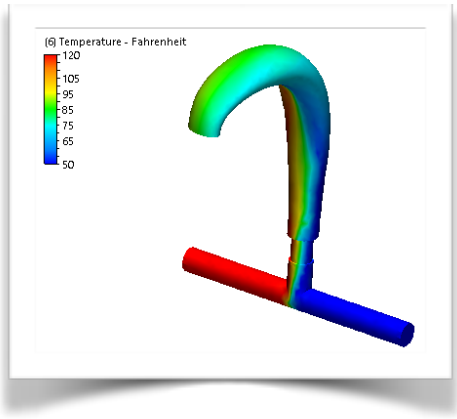


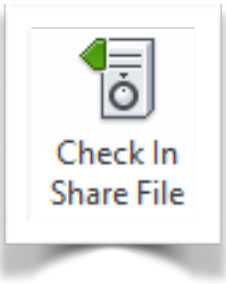
2. Update Design and select Design 2





3. Solve and check into Vault





Optional steps include setting up planes, traces, and running analysis and comparing the results between Design 1 and Design 2 with in the Design Center to prove design intent was captured.