An Evaluation of the Pro/ENGINEER Associative Interface for Abaqus/CAE

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Abstract: *As design cycle times are shortened, engineers continue to find ways to be more productive. Generally, one tries to leverage software tools to get solutions faster. This productivity improvement is possible through continued software advancements, such as the Pro/ENGINEER to Abaqus/CAE Associative Import, via an Elysium Neutral (Assembly) File. Engineers can iterate from CAD to FEA while retaining applied loads and boundary conditions. This paper will discuss use of the associative import features with design changes (such as thickness change, split surfaces, or holes). The pros and cons in using the tool will be tabulated. The reader will see that using the associative import can reduce design iterations from weeks to days.*

Keywords: *Pro/ENGINEER, Pro/E, Pro, Associative Interface, Interface, Abaqus/CAE, Abaqus, CAE, FEA, Finite Element, Finite Element Modeling, CAD, Automatic Associative Import, Manual Associative Import, Direct Translator, NonAssociative.*

1. Introduction

Recurring issues in the finite element analysis (FEA) world has been retrieval of clean geometry, and geometry creation limits in FEA software. Since geometry creation is not a specialty of finite element software, limited emphasis has been placed on the geometry engine. Most emphasis, as expected, has been on the analysis engine (mesh generators and solvers).

Rightfully, computer aided design (CAD) software has specialized in geometry creation and have remained the primary software for this arena. CAD software companies are used by large corporations because of their CAD capabilities in geometry creation, modeling, and their ability to connect to other software.

Pro/ENGINEER (Pro/E) is one such CAD software company that provides geometry based capabilities needed for FEA connectivity by Abaqus analysis software. But like other FEA companies, the concern is that the CAD package and the FEA package are not linked. Once the geometry is created in the CAD software, it is important to import the geometry data into the FEA software without losing geometry features.

This has been accomplished by translators developed by different companies. The translators are either connected or unconnected mode translators. They maintain a connection between the CAD software and the FEA software or they do not. Sometimes the terms plug-in (connected) or reader