

Accelerated Simulation Performance through High Performance Computing for Advanced Sealing Applications

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Abstract: The automotive and heavy-duty industries are heavy users of Computer Aided Engineering (CAE) for development, design and performance optimization of their products. As a technology driven company, the Sealing Products Group of Dana Holding Corporation utilizes this technology extensively, especially for metal cylinder head gaskets (CHG) and exhaust gaskets, so called Multi-Layer-Steel (MLS) gaskets. Due to the widespread involvement of complex contact interactions in high fidelity sealing system analysis, high performance computing is essential to accelerating the design process, thus meeting aggressive time and cost to market requirements.

Since the release of Abaqus version 6.6 a major step forward was made through the extensive and effective use of parallel computing. The combination of flexible computing clusters and the power of parallel processing enabled by SIMULIA resulted in significant time and cost savings for Dana when using the Abaqus engineering software package. It also allowed for the implementation of new simulation techniques for contact simulations. This allowed for better and more accurate up-front prediction of sealing technology.

This paper provides an overview on accelerated simulation performance studies utilizing the latest SIMULIA technology for advanced sealing application from the Sealing Products Group of Dana Holding Corp. Furthermore it provides an outlook of steps to come.

Keywords: CAE, High performance computing, cluster, SIMULIA, Abaqus, Dana, sealing products, contact