MSC.Nastran™ Toolkit

Programming Interface to MSC.Nastran™ and Its Database

OVERVIEW
SimOffice™ is a stand-alone environment in which engineers can build, test, review, and improve their designs. SimOffice gives product development engineers the shared technologies they need to assess product performance and accelerate innovation.

The MSC.Nastran™ product family is modular, enabling you to analyze products ranging from simple components to complex structures and systems. This also enables you to start simply and to grow your analysis capabilities as your Virtual Product Development (VPD) needs expand. As part of your VPD process, you can use MSC.Nastran to assess many functional aspects of your products, such as the structural response (displacement, strain, stress, vibration, and temperature) due to its material properties and the loads and boundary conditions that are applied to it during operation.

MSC.Nastran™ Toolkit
The MSC.Nastran Toolkit module provides an application-programming interface (API) through which customized standalone applications can be created that communicate directly with MSC.Nastran program using client-server technology. This API provides a modern software framework that can be used to create standalone applications that can access all of MSC.Nastran's functionality, such as matrix operations, utilities, engineering (finite element) functions, and database management system. This framework facilitates multi-tier architectures, Web-enabled applications, and allows the distribution of MSC.Nastran's functionality across different host computers.

Example of 'On-the-fly' Data Recovery - A single toolkit client program controlling multiple servers/machines with each server receiving multiple input files (.bdf's).

Interactive Control of MSC.Nastran
This toolkit makes it possible to construct client applications that perform calculations “on-the-fly” through the toolkit’s ability to interact with MSC.Nastran at both the input file level as well as the database and executable system level. Multiple input files (.bdf's) and associated DMAP sequences can be submitted interactively during one client session with the resultant module output (data blocks) being immediately accessible for interrogation by, or input to, the client application. In addition, an MSC.Nastran Toolkit-enabled client program can interact with multiple servers that can reside on different computers.

PRODUCT LINE
SimOffice™
Product Family
MSC.Nastran™

CAPABILITIES
- Interface to MSC.Nastran Using the C, FORTRAN, and JAVA Programming Languages.
- Access to the MSC.Nastran DMAP Solution Sequences, Database, and Bulk Data.
- Read / Write Directly to the MSC.Nastran Database.
- Read Labeled Direct Access (keyed) Model and Results Data.
- Filter Data Using SQL-Like Commands.
- Control the Processing of Multiple Bulk Data Files to One or More Computers Through an Internet Connection.
- Interactive DMAP to Control the Solution of Each Job Using Breakpoints.

BENEFITS
- Save Time by Coupling Proprietary Programs Directly to MSC.Nastran.
- Combine the Power of MSC.Nastran's General-Purpose Solutions with Other Programs to Extend Your Simulation Capabilities.
- Interactively Control the MSC.Nastran Solution Sequences to Perform "What-If" Studies or Review Intermediate Results for Improved Decision Making.
- Reduce Time and Cost Through the Elimination of Intermediate Files Such as Output2, Output4, Punch, .XDB, and .F06 Files Used to Transfer MSC.Nastran Results Data to Other Applications.
- Reduce MSC.Nastran Hard Disk Usage for Data Storage.
Breakpoint functions can be used to control MSC.Nastran DMAP sequences similar to those found with interactive programming debuggers. Multiple breakpoints can be set throughout a DMAP solution sequence to perform “what if” studies or halt MSC.Nastran to wait for interactive instructions, view intermediate results, perform database reads and writes, and then continue the execution. Alternatively, you can stop execution, submit a new (.bdf) file or execute a new DMAP sequence, and continue.

Read and Write to MSC.Nastran's Database

MSC.Nastran Toolkit provides a full set of functions to interact with the MSC.Nastran database including:

- Determine the contents of an existing database including the entire database dictionary attributes associated with a data block (table or matrix) or parameter.
- Find the schema (set of qualifiers) for any new or existing data block.
- Get the data definition (labels and types) for the described data blocks.
- Create a new data block.
- Open / Read an existing data block.
- Write to a data block.
- Index data blocks containing model data and results data.
- Read data associated by subcase, element or grid ID.
- Filter data by selection based on one or more fields.

Develop New or Enhanced Applications

Various MSC.Software products including MSC.Flight Loads™ and MSC.Patran™, as well as other customer specific applications developed by MSC.Software, use the MSC.Nastran Toolkit. The MSC.Nastran Toolkit delivers new robust development tools enable direct client-server access to MSC.Nastran, which enhances the capabilities of your virtual product development process.

EXTEND YOUR INVESTMENT

MSC.Software recommends MSC.Patran™ or MSC.SOFY™ for an integrated modeling and analysis environment.

MSC.MasterKey™ delivers a flexible, token-based licensing system that provides access to the breadth and depth of MSC.Software’s world-class Virtual Product Development software portfolio, allowing you to use whatever simulation tools you want, whenever you need them – maximizing your productivity and reducing cost.

MAXIMIZE YOUR RETURN ON INVESTMENT

MSC.Software provides the most comprehensive training, support, and professional services with offices worldwide to provide local and centralized support. Investing in MSC.Software gives you access to extensive client support through comprehensive documentation, direct technical expertise, and customized onsite and offsite training classes taught by experienced engineers.