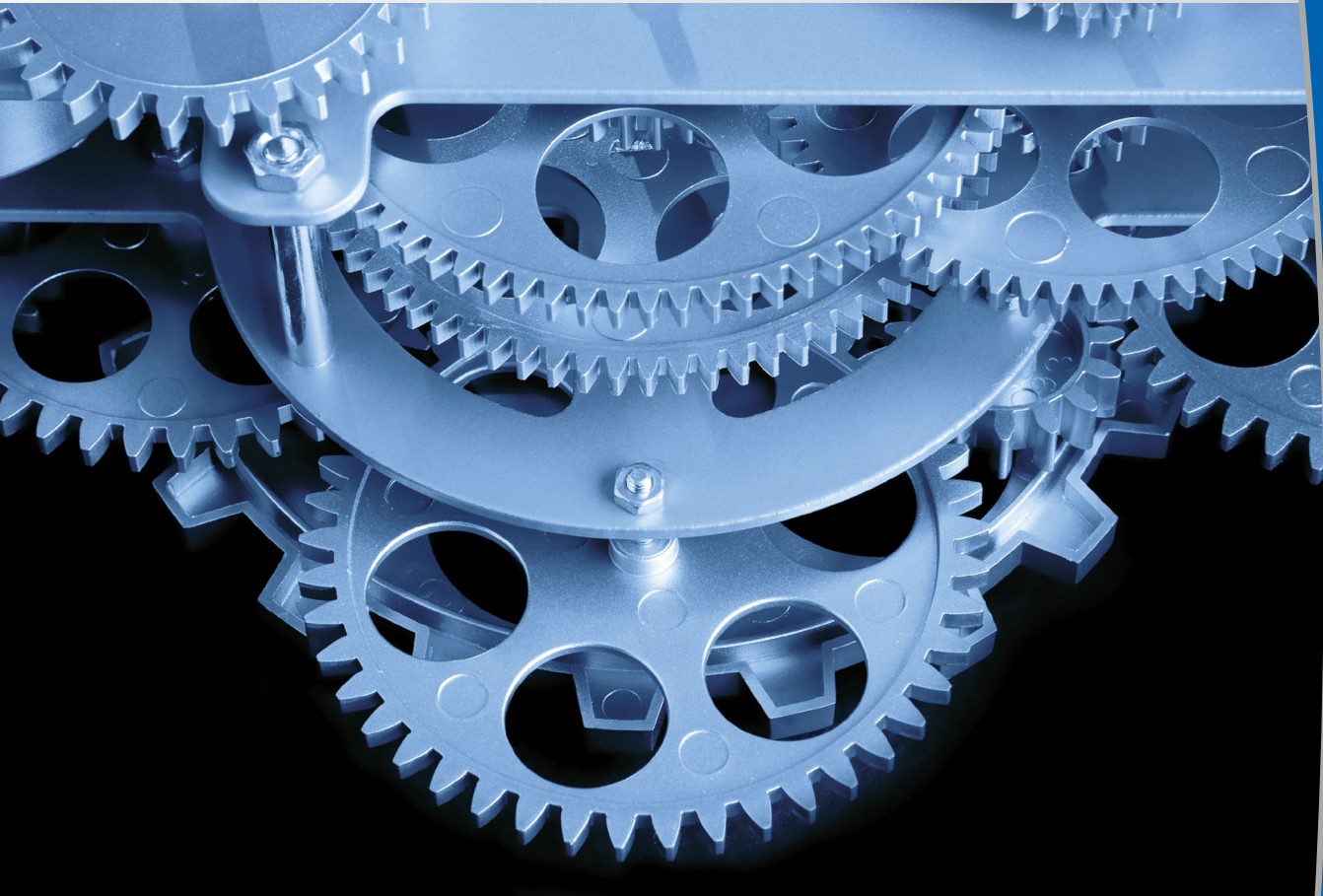




OPTRAN
CAE Process Optimization

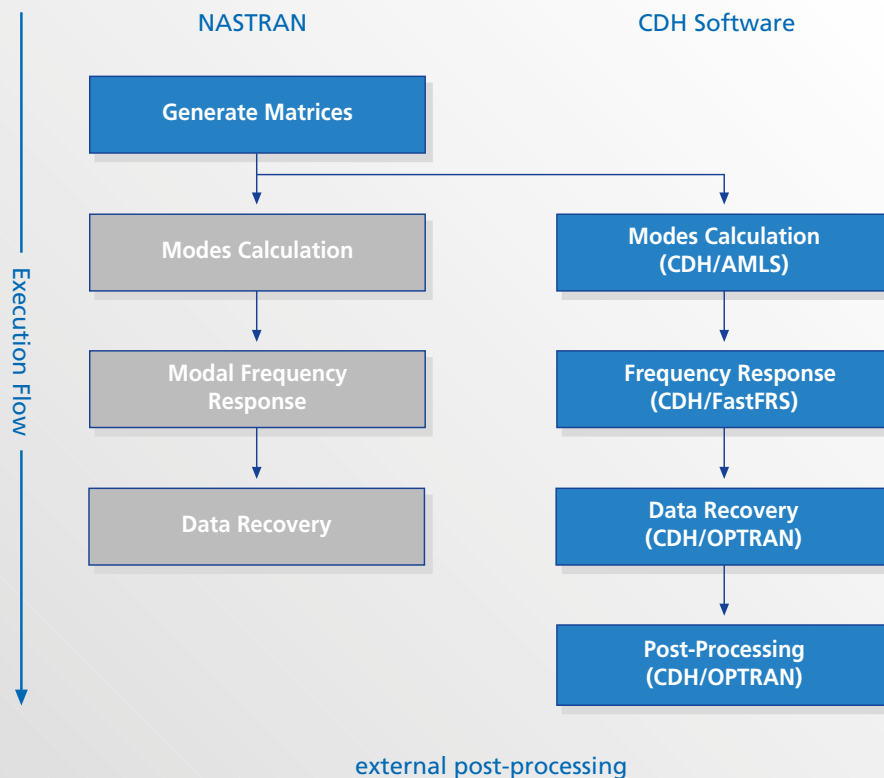
The logo features a blue gear icon to the left of the word 'OPTRAN' in a large, bold, black sans-serif font. Below it, the tagline 'CAE Process Optimization' is written in a smaller, black sans-serif font.

Introduction

Increasing number of automobile platform derivatives and challenging NVH performance targets require the utilization of efficient NVH CAE process tools. CDH/OPTRAN is a software solution that enables NVH engineers to perform automated NVH analysis and post-processing using efficient procedures developed by CDH AG.

Execution flow

CDH/OPTRAN calculates the frequency response functions (FRFs), operational shapes, mode shapes, mode participation and panel participation factors for large finite element models with multiple loading conditions. After the computation of the global stiffness, mass and damping matrices in NASTRAN, the CDH/OPTRAN process releases NASTRAN licenses and tokens even before CDH/AMLS starts. The CDH/OPTRAN process is illustrated in the following diagram:



CAE Process Optimization

To meet NVH design requirements, comfort relevant response results must be calculated for many simulated load cases including engine idle, wheel out-of-balance, road excitation etc. Typically, the following response functions must be calculated for all load cases:

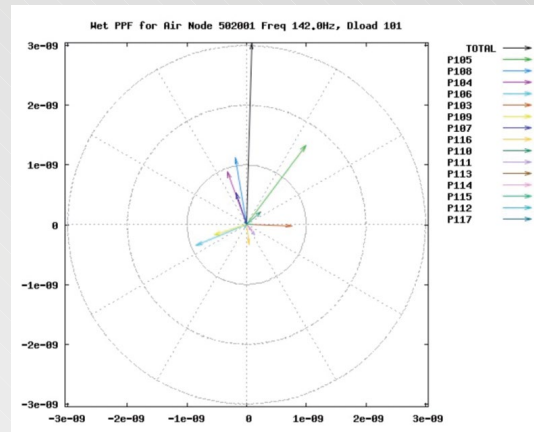
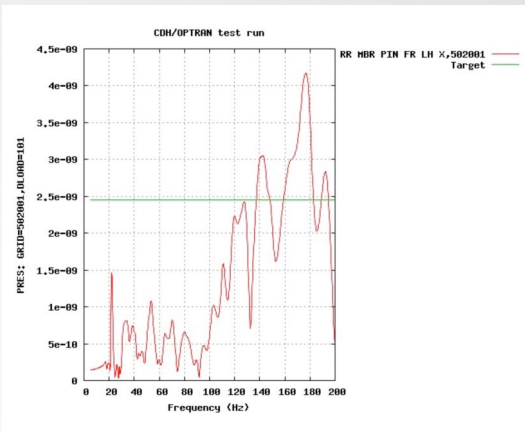
- Vibration transfer functions for seats and their connection points, foot-position panel vibrations, steering wheel vibrations, mirror and headlight vibrations
- Noise transfer functions between mechanical excitation points and driver and passenger ear sound pressures responses
- Driving point response mobility for driveline/suspension connection points and sub-frame attachment points

In practice, the number of individual NVH load cases to be considered can easily exceed 200 load-cases. Post-processing the frequency response functions is in itself a major operation. Once critical responses have been identified, it is necessary to re-repeat the analysis to obtain other information such as operational shapes and panel participation factors. CDH/OPTRAN is specifically designed for NVH analysis efficiency.

CDH/OPTRAN enables users to submit analysis jobs in batch mode after defining load cases, target responses and post-processing requirements. Uncritical responses below their target limits are automatically omitted in the output of plotted response results.

Analysis and Post-Processing Features

- Frequency response functions
- Panel participation factors
- Operational shapes
- Grid panel participation factors



CDH/OPTRAN Advantages

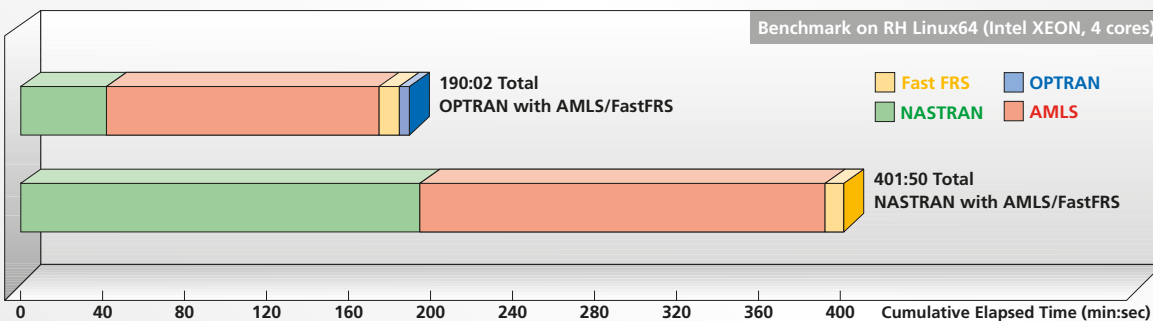
- CDH/OPTRAN allows the definition of target responses for each selected load case and response degree of freedom
- CDH/OPTRAN automatically identifies response target violations
- CDH/OPTRAN automatically identifies uncritical responses below target limits and these are omitted in the output of plotted response results. The analyst can therefore concentrate on the solution for critical responses
- CDH/OPTRAN interfaces seamlessly with CDH/AMLS and CDH/FastFRS to drastically reduce computational resources such as CPU time, I/O and disk space

Output

- NASTRAN punch format
- MEDINA .bof format (mode and operational shape output)
- FEM post-processing supports .jpeg, .tiff, .png, .ps, .csv or .eps format
- Future versions will allow element-based data recovery such as element strain energy, stress etc.

Performance Example

- Model data
 - 700K DOFs
 - 4544 structure modes
 - 188 fluid modes
- Data recovery
 - 45 structure DOFs and panel participation factors
 - 20 load cases
 - 195 excitation frequencies



System Requirements

Hardware:

- RH/SUSE Linux64 (Intel Xeon, AMD Opteron)

Software:

- MSC NASTRAN Version 2008+
- NX-NASTRAN Version 7+

MSC NASTRAN is a proprietary product of MSC Software Corporation

NX-NASTRAN is a proprietary product of Siemens PLM Software Corporation

MEDINA is a proprietary product of T-Systems International GmbH

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