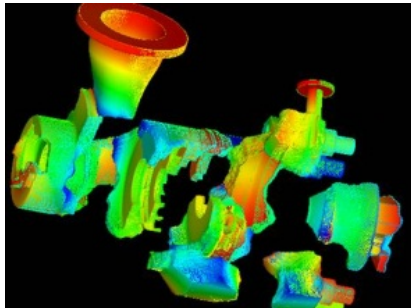
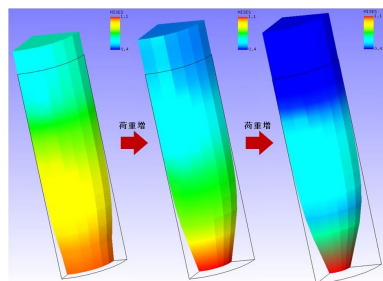
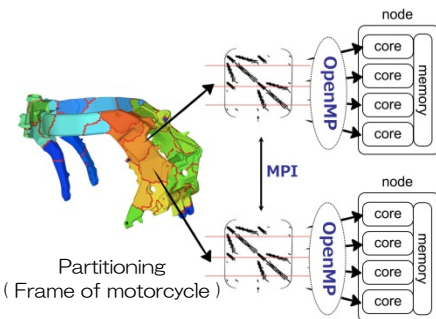


Nonlinear analysis functions have been deployed on a parallel FEM basis.
Running on a note PC, PC clusters and supercomputers, FrontISTR provides innovative tools for practical and advanced structural analysis.

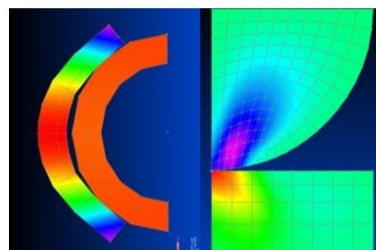
Large-scale parallel analysis



Domain decomposition for parallel computing

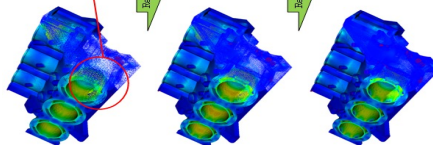
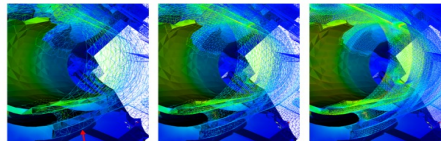


Elastic-plastic analysis
(Forming of bar)

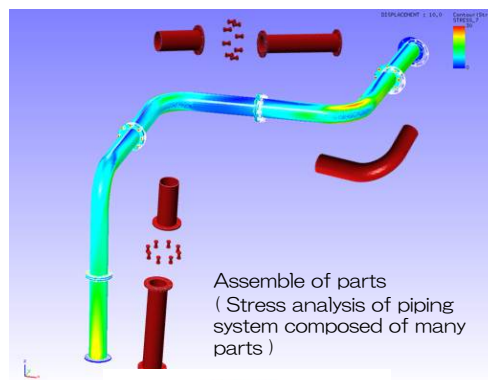


Contact analysis (Contact point transfer,
Hertz contact problem)

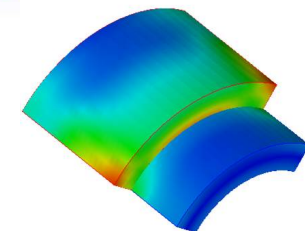
Accurate assembled structure



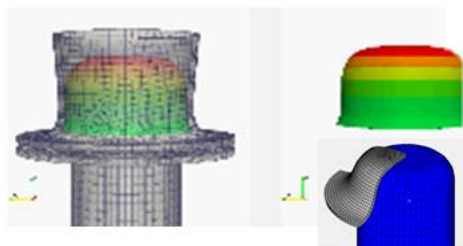
Accurate analysis aided by "Refiner"
(Thermal stress analysis of engine block)



Assembly of parts
(Stress analysis of piping
system composed of many
parts)

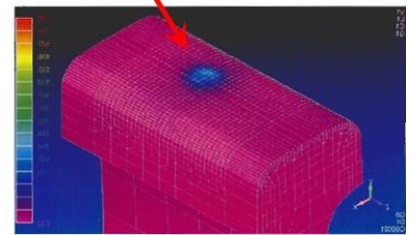
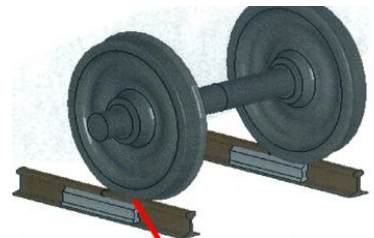


Contact indentation of cylinders

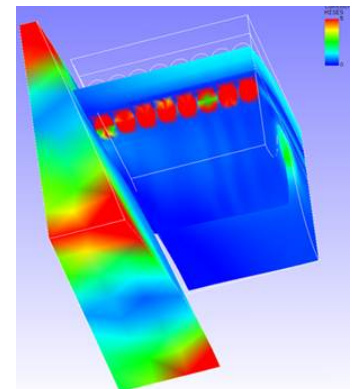


Cupping press simulation

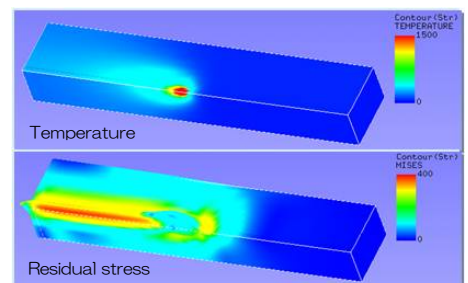
Material & geometrical nonlinear



Rolling contact between fast
running train's rail and wheel



Frictional power transmission belt



Thermal-elastic-plastic analysis of welding
residual stress

Massively parallel, PC cluster, Cloud



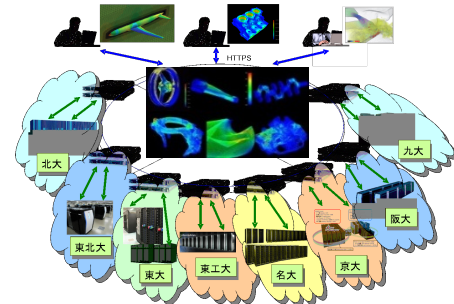
K computer



Win-note cluster

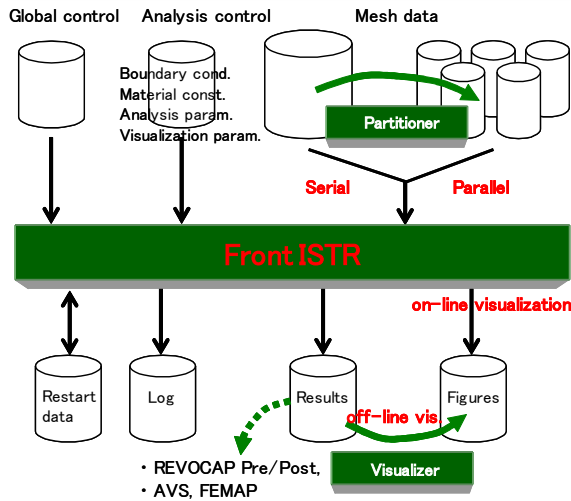


PC cluster



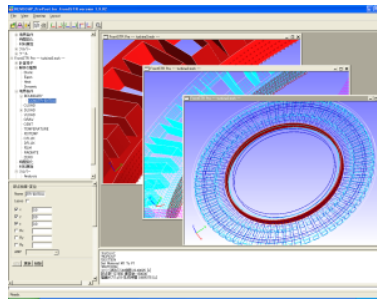
CAE supercomputer cloud

Simple procedure for parallel computing



SPMD (Single Program Multiple Data) program performs parallel computations when mesh data is decomposed by the partitioner.

Pre/Post processing



REVOCAP Pre/Post, which is also being developed at the project (*), is available. At the pre-processing stage, IGES data is read, and the input data for FrontISTR is obtained through mesh generation, assembly and BC settings.

An alternative to post-processing, FrontISTR can generate files for AVS and FEMAP

Screenshot of REVOCAP Pre/Post

Documents / Examples

Installation manual / User's manual / Tutorial guide (currently, in Japanese only). 15 examples for various type of analyses.

Platforms

OS : WindowsXP(32bit) / Linux(32bit, 64bit), Executable module is available for Windows.
C compiler : gcc, Intel C Fortran compiler : Intel Fortran
Supercomputers : HA8000(Univ. of Tokyo), PRIMERGY(Kyushu Univ.)

Function	Supported contents	
Static linear	(Including thermal stress analysis)	
Static nonlinear	Material	Hyper-elasticity/Thermal-Elastic-Plastic/Visco-Elastic/Creep, Combined hardening rule
	Geometry	Total Lagrangian/Updated Lagrangian
	Boundary	Augmented Lagrangian/Lagrangian multiplier method, Finite slip contact, Friction
Dynamic linear	Explicit method / Implicit method	
Dynamic nonlinear	Explicit method / Implicit method	
Eigen value	Lanczos method	
Heat transfer	Steady / Non-steady (implicit), Material nonlinear	
Element type	Tetra/Hexa/Prism, Shell, 1st / 2nd order, Incompatible mode, SRI	
Utilities	User's subroutine, Restart, Step control of boundary conditions	

Function	Advanced characteristics
Hierarchical mesh refinement	Analysis of large-scale accurate models with REVOCAP_Refiner
Assembled structure	MPC-preconditioned iterative solver, Finite Slip Contact, Friction
Multigrid method	Convergence acceleration utilizing hierarchical meshes
Enhanced parallelism	Efficient parallel computation using O(10 ⁵) nodes
Parallel solver	Preconditioned iterative solvers / Parallel direct solver
Parallel visualization	Surface/Volume rendering, on-line visualization
Coupled analysis	Fluid-structure analysis with FrontFlow and REVOCAP_Coupler

